# Servant Leadership and Team Effectiveness:

# A Study of Industrial Manufacturing Correlation

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# ABSTRACT

The correlative study considered the association between servant leadership and team effectiveness in the manufacturing sector of business and industry. The quantitative study had a sample size of 3896 at 28 manufacturing locations within the same organization. The Spearman rank correlation was used to determine the direction and significance of the association between the independent variable of servant leadership and each of five dependent variables of manufacturing team effectiveness. To achieve the purposes of the research study, one standardized instrument— the Organizational Leadership Assessment (OLA)—was used to measure servant leadership at each location surveyed.

The exploratory data analysis revealed significant correlation between servant leadership and a reduction in both absenteeism (H1) and attrition (H2) rates. As a result, an exponential curve was created and absenteeism was shown to decrease roughly 41.1% for each increase of one unit within the five unit scale of servant leadership, while attrition tended to decrease roughly 22.4% for each increase of one unit in servant leadership. The research data did not support the existence of a relationship between servant leadership and the recordable accident rates (H3), accident severity rates (H4), or defective parts produced rates (H5).

The implications related to these findings are significant in the manufacturing environment as business and industry struggle with increased economic growth, shortage of skilled labor, and employee turnover. It is hoped

that this research study inspires additional interest and empirical research into the potential value of servant leadership in the workplace.

# DEDICATION

To Janet:

Whereas my Mother gave me the gift of birth;

you have blessed me with the gift of life.

# ACKNOWLEDGEMENTS

As I reach the completion of this part of my journey, I wish to acknowledge significant individuals who have supported my labors. I have come to understand clearly that we stand on the shoulders of others during times of great challenge, growth, and accomplishment.

To my Lord and Savior, I give praise for granting me the mental courage and physical strength to endure this exhausting journey. I further give him thanks for the gift of free will. This blessing enabled me to more fully experience the joy of accomplishment.

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TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

# CHAPTER 1

## INTRODUCTION

In recent years, American businesses have embraced employee involvement as they participate in a highly competitive, international marketplace (Das & Jayaram, 2007; Schron, 2006). Employee contribution to team effectiveness is being viewed as important in the struggle to remain financially viable (McCarter, Fawett, Magan, 2005). Scholars have claimed that employee engagement predicts employee outcomes, organizational success, and financial performance (Bates, 2004; Baumruk, 2004; Richman, 2006). Covey (1989) put forward the idea that the essence of team effectiveness required a balance between production and what he called *production compatibility*— the abilities and assets that produce the desired results.

In a climate that features shared technology, instant communication, and worldwide challenges, the presence of effective production teams represents competitive advantage, especially in industrial manufacturing settings. As the search for increased understanding of what facilitates team effectiveness continues, plant-based case-study strategies are becoming a widely used approach in operations management research. These efforts help reduce the gap between theory and practice (Hill, Nicholson & Westbrook, 1999).

Little empirical research on exactly what team leaders do to assist team effectiveness has been undertaken by the research community (Guzzo & Dickson, 1996; Kozlowski & Bell, 2003). Thus, a need exists for empirical research that examines the relationship between leadership approach and team

effectiveness. This research project has endeavored to increase the understanding of this relationship.

## Leader to Follower

Early leadership studies dealt with the individuality of the leader because many researchers believed that the key to unlocking the secrets of leadership was held in an individual leader's inherent and distinctive talents (Bird, 1940). The notion was that, in times of need, a Great Man (leader) would reveal himself. Subsequent studies focused on identification of the unique traits that distinguished leaders from those who were not leaders. Failure to find universal leadership traits led researchers to posit that leaders adopt appropriate leadership behaviors in relation to those with whom they serve. Researchers then speculated that the leader's ability to lead is contingent upon various situational factors.

As the 20th century ended, leaders began to engage employees with vision and passion by injecting enthusiasm and energy, all in an effort to transform their follower (Burns, 1978; Coleman & La Roque, 1990; Kirby, Paradise, & King, 1992). Mutual influence of leader and follower in facilitating performance and organizational effectiveness is a common theme that permeates current leadership research efforts. Shared or distributed leadership allows the employee to take initiative, embrace risk, stimulate innovation, and cope with uncertainty (O'Toole& Lawler, 2006). A prominent theory in this sphere of leadership study is servant leadership. Handy (1995), in his *The Age of Paradox*, differentiated the old-fashioned "follow me" form of leadership from

what he called distributed leadership. He suggested that distributed leadership is present in the stewardship of all participants in servant leadership. An essential component of this mindset asserts that leaders serve the people they lead, thereby implying that they are an end in themselves rather than a means to an organizational purpose (Greenleaf, 1977). Servant leadership, however, differs from other leadership approaches by avoiding the common top-down command and control style, instead emphasizing partnership, trust, empathy, and the ethical use of power. The objective is to enhance the growth of individuals, increase teamwork, and expand personal involvement in the organization. Recent studies have examined the importance of the development of employee influence in the leadership process (Bryant, 2003; Hallinger & Kantamara, 2000).

As interest in the historical importance of the leader has transitioned to consideration of the potential of followers, research interest in servant leadership theory has increased. Leading authors of leadership and organizational development have continued to research and discuss the effects of servant leadership on employee satisfaction and organizational effectiveness (Blanchard, 2007; Depree, 1989; Senge, 1990). At the same time, a number of companies have adopted servant leadership as their corporate identity. In *Focus on Leadership: Servant Leadership for the 21st Century*, Spears (2002) identified the following companies that have incorporated servant leadership into their corporate philosophy: The Toro Company (Minneapolis, MN), Synovus Financial Corporation (Columbus, GA), Southwest Airlines (Dallas, TX), The Men's Wearhouse (Fremont, CA), and TD Industries (Dallas TX) (p. 9). Servant

leadership is an emerging leadership theory that exhibits promise in revitalizing and energizing employees as business and industry brace for the challenges of the 21st century and beyond. Consequently, servant leadership is receiving increased consideration and mounting acceptance in the corporate world.

This study's findings will contribute to the body of knowledge concerning leadership theories and team effectiveness by providing empirical evidence of correlative value. The specific focus of this study lies in the examination of the potential correlation between servant leadership and team effectiveness. By applying the Organizational Leadership Assessment (OLA) of servant leadership and comparing that to team performance measurements within the same organization, a correlative value can be established. An understanding of the correlation of leadership behaviors and team effectiveness is necessary in order to better understand how to motivate employees effectively. Developing teams to achieve organizational goals offers stability and growth to business and industry (Vickers, 2007; Katzenback & Smith, 1993; Sweezy, Meltzer, & Salas, 1994).

The first chapter of this study provides an introduction that reveals the context for the study, discusses the questions considered, identifies theoretical / conceptual frameworks, and offers definitions of terms and limitations. Chapter 2 reviews the literature associated with the constructs of servant leadership and team effectiveness. The chapter also reviews recent research and provides the historical context for servant leadership and team effectiveness. In Chapter 3, descriptions of the methods of research used as well as sampling, validity, instrumentation, data collection, and data analysis are discussed. Chapter 4

presents the research findings, reviews the results, and offers data analysis and commentary. Finally, Chapter 5 provides a summary of the study, discusses implications of the findings, and identifies potential future research.

## Problem Statement

Many modern organizations utilize teams to produce goods and services (Appelbaum & Batt, 1994; Cohen & Bailey, 1997). Consistent empirical support for a positive link between entrustment to teams and both idea generation and positive application behavior exists (Amabile, Schatzel, Moneta, & Kramer, 2004; Unsworth & Parker, 2003; Van de Ven, 1986). In the hurried business environment, teams enable organizations to quickly adjust to changing circumstances in order to remain at the forefront of their respective market segments. Therefore, identification of an effective leadership approach that facilitates team effectiveness is an important research area.

A problem within business and industry is selecting the particular leadership approach that will engage employees and have some bearing on team effectiveness. In an effort to advance the understanding of leadership influence on team effectiveness, the problem statement that follows considers the correlation or lack of correlation between servant leadership and team effectiveness within the manufacturing environments that were examined in this study.

## Purpose of Study

The purpose of this research was to increase the understanding of servant leadership in the under-researched area of business and industry. To serve this

purpose the study used a correlative quantitative research method and was based on employee ratings of servant leadership tendencies within organizations as well as routine performance measures used when determining the effectiveness of manufacturing teams. The specific research population was in the automotive parts manufacturing segment of business and industry and encompassed a four-state region of the Midwestern United States. Servant leadership served as the independent variable, and team effectiveness measurements were the dependent variables of the study.

## Significance of Research

The significance of providing empirical research related to servant leadership and team effectiveness is important in today's business environment. It has been reported that the majority of workers today are not fully engaged and this *engagement gap* is costing U.S. businesses 300 billion dollars per year in lost productivity (Bates, 2004; Johnson, 2004; Kowalski, 2003). In many organizations, the followers' desire for inclusive leadership and follower involvement is linked to a relationship that appears to be damaged. Deal and Kennedy in their book, *The New Corporate Cultures* (2000), suggested that the balanced image of a corporation as the servant of many constituencies has shifted to a single focus on shareholders and short-term financial performance. This shift has undermined an unspoken, long-standing belief in the shared interest between employer and employee. This widely shared principle carried the promise that if employees worked to the best of their abilities, a company

would provide a positive working environment, job security, and reasonable compensation.

Based on this damaged relationship, leadership research has an increasing interest in the study of the involvement of followers within the leadership dynamic. Employee performance affects organizational achievement, and leaders of organizations influence follower achievement (Northouse, 2004; Yukl, 2002). Research that increases understanding of leader influence on follower achievement is significant. This study acknowledged the follower-focused nature of servant leadership and joined other research efforts in confirming the possible correlation or lack thereof between servant leadership and the effectiveness of organizations (Gibson & Vermeulen, 2003; Irving, 2005; LaFasto & Larson, 2001; Naquin & Tynan, 2003).

The current study also has attempted to offset the unbalanced focus of prior empirical inquiry into servant leadership theory that has favored not-for-profit (NFP) organizations. In the past, scholars focused primarily on spiritual and educational organizations (Dillman, 2004; Drury, 2004; Hebert, 2003; Hoshaw, 1985; Iken, 2005; Irving, 2005; Sullivan, 1994; Van Kuik, 1998; Walker, 1997; Woodward, 1988). This inclination toward the NFP sector could lead some researchers to conclude that servant leadership theory assessment is somewhat contextually constrained. Thus, this study has the potential to generate increased interest in servant leadership and team effectiveness research in business and industry.

## Nature of the Study

This study was designed to provide data related to servant leadership and team effectiveness variables inside the manufacturing environment and represent the findings in a correlative format. The context of the study is contained within the manufacturing segment of business and industry in the Midwestern U.S.

### *Team Effectiveness Measurements*

The study measured the effectiveness of each sample group by gathering data related to attrition, absenteeism, accident frequency, accident severity, and defective parts produced rates. To determine effectiveness levels, these measures were compared to established manufacturing industry averages.

Likert and Pyle (1971) were among the earliest proponents of human resource-related accounting measures and listed the following benefits:

- To furnish cost value information for making management decisions to attain cost effective organizational objectives,
- To allow management personnel to monitor effectively the use of human resources,
- To provide a sound effective basis of asset control, and
- To aid in the development of management principles by classifying the financial consequences of various practices.

In 1991, the Swedish government proposed a legal obligation for organizations with more than 100 employees to provide an account of personnel costs such as attrition, absenteeism, and training in their annual reports (Grojer &

Johanson, 1998). The proposal was based on the opinion that human resource investment translated to market advantage and profitability. The profitability implications of each effectiveness measurement of this study will be identified in Chapter 2.

Based on its widespread use within the manufacturing environment, the Balanced Scorecard Method / Key Performance Indicators were used when selecting measures of effectiveness (Atkinson & Brown, 2001). Kaplan and Norton (1992) introduced the Balanced Scorecard concept in their *Harvard Business Review* article, “The Balance Scorecard – Measures that Drive Performance.” The scorecard provides managers with a comprehensive framework that translates a company’s strategic objectives into a coherent set of performance measures. The company featured in this study, while utilizing the Balanced Scorecard Method (BSC) concept, selected measures of effectiveness from the Key Performance Indicator (KPI) guidelines. Chapter 2 of this study more fully describes the BSC and KPI.

*Servant Leadership Measurement*

Servant leadership is measured in the study by using the Organizational Leadership Assessment (OLA) instrument (Laub, 1999). So that a consensus was established with regard to which characteristics most accurately depict the presence of servant leadership, this instrument originated from a 14-member panel of experts using a three round Delphi technique. Laub (1999) developed the OLA for the purpose of:

> Assessing organizational health based on six key areas of effective organizational leadership. These key areas of organizational and leadership practice are critical to achieving optimal organizational health. Healthy organizations display authenticity, value people, develop people, build community, provide leadership, and share leadership. (p.1)

The reliability of the instrument was determined by a Cronbach-alpha coefficient measure of .98 (Laub, 1999). The Cronbach's alpha measured how well the OLA questions measured the single construct of servant leadership. This was a coefficient of reliability. The OLA reliability is central to the study, based on the selection of servant leadership as the independent variable.

## Research Question

The research question is: To what extent are established manufacturing performance measurables correlated with the presence of servant leadership within the organization?

In relation to the research question, the following hypotheses will be tested:

$H1^{o1}$: No significant relationship between team effectiveness and servant leadership as measured by the OLA.

$H1^{a1}$: Significant relationship between team effectiveness and servant leadership as measured by the OLA.

Based on the research interest of the study, evidence was evaluated, potential relationships studied, and new questions considered.

## Conceptual / Theoretical Framework

The study involved an examination of if servant leadership was present within effective teams. To accomplish the purpose of this study, the conceptual structure balanced two constructs. The initial construct was a measurement of servant leadership within each sample group, while the second construct involved the measurement of team effectiveness within the same sample.

### *Team Effectiveness Constructs*

Many companies still rely on traditional cost-related performance measures of profit margin, cash flow, and return on investment when measuring the effectiveness of an organization. Researchers have documented the limitations of these traditional financial measures in the evaluation of organizational effectiveness (Kaplan & Cooper, 1998; Maskell, 1992). Critics have argued that reliance on traditional financial indicators might lead to promoting short-term thinking (Banks & Wheelwright, 1979; Hayes & Garvin, 1982).

Due to the complexity of the current manufacturing environment, the importance of employee engagement, and the pressures of an increasingly global economy, this study chose performance measures that were dimensions of employee behavior and engagement. Dependent variables of team effectiveness were represented by the measurement of goal obtainment in the areas of absenteeism, attrition, accident frequency, accident severity, and defective parts produced. These cost performance measures offered objective evidence, benchmarking with other organizations, and strategic decision making

assistance to the organization under study (Flapper, Fortuin & Stoop, 1996; White, 1996). These dependent variables were measured to determine the correlation with the independent variable of servant leadership. Chapter 2 will detail the importance of these performance measurables in relation to profitability.

*Servant Leadership Construct*

The independent variable of servant leadership was measured using the Organizational Leadership Assessment (OLA) instrument. Servant leadership was the independent variable group classification against which the dependent variables were predicted to differ (Siegle, 2007). Chapter 2 will outline the rationale for the selection of the OLA instrument.

## Limitations of the Research

This study was limited by the organizational context of the sample groups (manufacturing setting). The study examined multiple sites of similar organizations, and therefore, the results might not be generalizable to other populations. Further research might be necessary to explore the generalizability of this inquiry.

## Definition of Terms

*Servant Leadership.* The seminal component of the servant leadership perspective is the leader's perception that he or she is a servant first. The extent to which the leader can shift the primary focus of his or her leadership from the organization to the follower is the crucial element of the concept. The current study accepts Laub's identification of the key components of the servant

leadership: authenticity, valuing people, developing people, building community, providing leadership, and sharing leadership (Laub, 1999) (Figure 1.1).

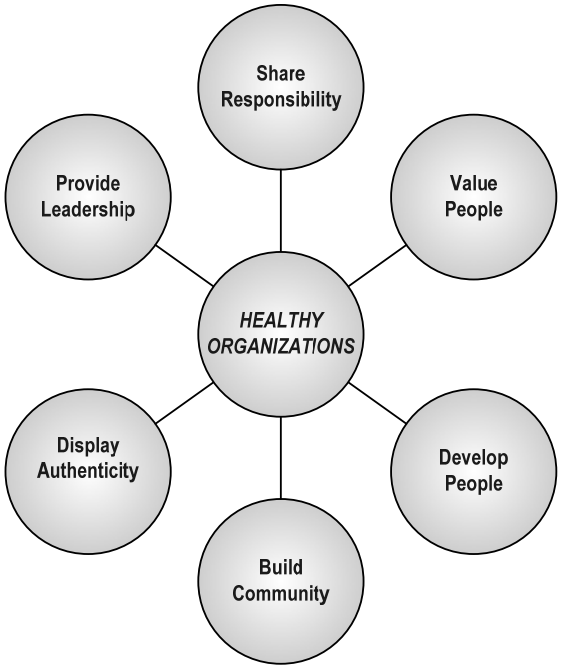



*Figure 1.1.* Laub's OLA Elements of Servant Leadership

*Team Effectiveness.* This study used a goal-centered model as a measure of team effectiveness based on a standard that assesses how well the organizational goals are being met. Higgins (1998) stated that organizational effectiveness is relative versus absolute.

*Teams.* The study's definition of team was: "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (Cohen & Bailey, 1997, p. 241).

*Leadership Mindset.* Leadership mindset was defined as habits of the mind that are loosely a frame of mind or a mental attitude as it relates to

leadership. The servant leadership references in the study refer to the six components of servant leadership that are detailed in the OLA instrument. (Laub, 1999).

*Goals.* Manufacturing business operations often use the SMART goal setting method. The acronym SMART refers to goals that are specific, measurable, acceptable, realistic, and timely. As explained by Covey (1998), these five components denote the following:

- Specific: goals should be explicit and unclouded—something to aim toward without misinterpretation.
- Measurable: goals must be measurable because the resulting objectivity helps define goals in terms of actions that one can readily see.
- Acceptable: even when goals are assigned by owners or upper management, those goals should not be imposed simply by nature of the positional authority which is held by upper management.
- Realistic: although goals should be challenging, they should also be set with regard to an individual's capabilities and limitations.
- Timely: the time dimension is a pressing issue, and therefore, goals should be temporally relevant, that is, appropriate for near-term concerns.

The specific goals that were used in this study reflect common automobile industry standards and represent the method of data gathering and evaluation that were used by the company utilized within this study (Risher, 2003).

*Employee Attrition.* Attrition was calculated by dividing the number of annual terminations by the average number of employees in the workforce. Layoffs and job eliminations were not included in this calculation.

A = Terminations ÷ # in the workforce

*Recordable Accident.* The lost-time recordable incident rate was calculated by occurrences per 200,000 hours worked, which is intended to approximate the experience of 100 workers during a full year by using this formula: number of lost-time injuries multiplied by 200,000 and divided by total hours worked equals the lost-time incidence rate (IR).

IR = Injuries x 200,000 ÷ Hours Worked

*Severity of Accident.* The severity rating is a method of expressing the number of lost, restricted, and transferred workdays occurring per 200,000 hours worked, which is intended to approximate the experience of 100 workers during a full year. The severity rate was calculated using this formula: number of lost days multiplied by 200,000 and divided by total hours worked equals the lost-time severity rate (SR).

SR = # of Lost Days x 200,000 ÷ # Hours Worked

*Absenteeism.* This was calculated as a percentage of absences as compared to scheduled hours. Paid absences such as vacation days, bereavement days, and holidays were not considered part of absenteeism calculations.

AB = unexcused absences ÷ scheduled days

*Defective Parts Per Million.* This is a measure of produced parts that fail to meet customer standards versus total parts produced. The calculation is: one million divided by the units shipped multiplied by the parts found defective. Defective parts were determined after the final manufacturing process was performed.

Defective Part Rate = 1,000,000 ÷ units shipped x defective parts

## Scope of the Study

The study gathered data from 28 automobile parts manufacturing facilities in four Midwestern states: Indiana, Michigan, Ohio, and Kentucky. The research sample covered 4,557 potential respondents at the 28 facilities included in the study.

## Dissertation Summary

This dissertation is presented in five chapters. Chapter 1 has introduced the context for the study, examined the research question, identified theoretical and conceptual frameworks, and offered descriptions of terms used within the study. The review of literature in Chapter 2 will provide historical context for servant leadership and team effectiveness as well as clarify the selection of servant leadership and team effectiveness measurements. Chapter 3 will explain the study's methods of research and show how validity, instrumentation, and data collection were reached. Chapter 4 will present the research findings, a review of results, and a comprehensive data analysis. Finally, Chapter 5 will provide a summary of the study, discuss implications of the findings, and posit a call for potential future research.

# CHAPTER 2

# REVIEW OF LITERATURE

Chapter 1 provided an overview of the research subject area and revealed the nature of the study and its primary questions. In Chapter 2, a review of literature will provide a summary examination of leadership theory and organizational effectiveness as they relate to the specific elements of the study.

## The Model of Team Effectiveness

### *Teams*

To meet the challenges that they face, business and industry are realizing the importance of the team-based organizational structure (Mohrman, Cohen, & Mohrman, 1995) and effectiveness (Nadler & Ancona, 1992). Beyerlein, Freedman, McGee, and Moran (2002) found that 80% of organizations with over 100 employees report that 50% of their employees are a member of at least one team. To remain competitive, evidence has pointed to the importance of creating and maintaining teams (Kozolowski & Bell, 2003). This study's definition of team is a version developed in Cohen and Bailey's (1997) research: "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems" (p. 241). This definition of team built on the work of Hackman (1987) and is similar to the definition that Gusso and Dickerson (1996) used in their review of research of groups and teams. As research on teams progresses, other researchers have cited the

seminal Cohen and Bailey definition of team (Arnold, Barling & Kelloway, 2001; Bailey, Brown & Cocco, 1998; Huusko, 2006; Senior & Swalies, 2004).

*Team Effectiveness*

Having established the importance of teams, studies began to examine team effectiveness within the business and industry segment, creating a rich history of empirical examination (Table 2.1).

Table 2.1

*Summary of Management Team Effectiveness Studies*

| | Author | N | Industry Segments |
|---|---|---|---|
| 1990 | Eisenhardt Schoonhoven | 92 | New semiconductor TMTs |
| 1990 | Finkelstein Hambrick | 100 | Computer, chemical, and natural gas TMTs |
| 1995 | Haleblian Finkelstein | 47 | Computer and natural gas TMTs |
| 1992 | D'Avent Hambrick | 114 | Manufacturing, retail , and transportation |
| 1994 | Isabella Waddock | 39 | Banking TMTs |
| 1991 | Jackson et al. | 93 | Bank holding company |
| 1995 | Korsgaard et al. | 20 | 3 divisions of high-tech companies |
| 1993 | Schwenk | 60 | Oil, chemical, and computer |
| 1994 | Smith et al. | 53 | High-tech TMTs |

Note. Adapted from Cohen and Bailey, 1997, p. 266.

Objective measures of effectiveness were used in a variety of areas such as return on equity (Finkelstein & Hambrick, 1990), return on assets (Michel & Hambrick, 1992), sales growth (Eisenhardt & Schoonhoven, 1990), and total return to shareholders (Haleblian & Finkelstein, 1993). Further studies have

utilized multiple measures of company performance (Finkelstein & Hambrick, 1990; Isabella & Waddock, 1994). As in past empirical studies, this research project examined effectiveness by using guidelines that are recognized within the industry under study. Organizational effectiveness within the manufacturing segment has traditionally been measured in relation to the achievement of preferred outcomes.

Dependent variables of team effectiveness were represented in the study by the measurement of goal obtainment in the areas of absenteeism, attrition accident frequency, accident severity, and defective parts produced. These dependent variables can be measured to determine the correlation to the independent variable of servant leadership.

*Automotive Manufacturing Team Characteristics*

Automobile manufacturing has used different models of work management over the years. The approach of Henry Ford in the early 20th century held that the workers' only contribution was manual labor in the form of repetitive work on the newly created assembly lines (Lewchuk & Robertson, 1997). Many differing views on and variations of this initial approach have been used within business and industry over the years, but in the manufacturing industry, a search for greater productivity has also existed (Zacharatos & Hershcovis, 2007).

The Japanese method of team-based solutions is extensively used today in the manufacturing environment. The Japanese leadership approach emphasizes self-control, autonomy, and creativity among employees and requires active cooperation rather than mere compliance (Vouzas & Psycgigios,

2007). For the purpose of this study the Japanese approach was used and organizational teams encompassed the entire employee population of each manufacturing facility.

*Team Effectiveness Models*

Beginning with the Hawthorne studies of 1927-1934 and continuing for 75 years, leaders have been interested in determining the components of team effectiveness within business and industry. Over the past 30 years, researchers have helped to define team effectiveness (Campion, 1993; Cohen, 1988; Ghalayini, Noble & Crowe, 1997; Gladstein, 1984; Gersick, 1988; Janz, Colquitt & Noe, 1997; Morgan, Salas, & Glickman, 1993; Spreitzer, 1996; Tannenbaum, 1992).

Hackman's (1990) research assessed team effectiveness in terms of three primary measures: the group's output meeting established standards, the group's ability to work interdependently, and the growth and well being of team members. The study measured effectiveness by comparing the team's ability to meet established standards. Hackman's earlier work was advanced by Guzzo and Dickerson (1996), Sundtrom, DeMeuse and Futrell (1990), Zaccaro and Marks (1999), and Kozlowski and Bell (2003). As businesses in the manufacturing field struggle to maintain market share and competitiveness, team effectiveness is increasingly being researched (Thorpe, 2004).

Covey (1989) believed that the important element of team effectiveness was a sense of balance between production and what he called production potential or the abilities and resources that produce a preferred outcome.

Additionally, Higgins (1998) stated that organizational effectiveness is relative versus absolute, meaning that goal obtainment is measurable and specific to individual situations. Each of these efforts contributed to the body of knowledge about teams by exploring new paths in some areas and shifting the paradigm in others. From these research efforts, Henri (2004) developed the primary grouping of theories of effectiveness, which include focus models, goal models, system models, and strategic constituencies' models (Figure 2.1).

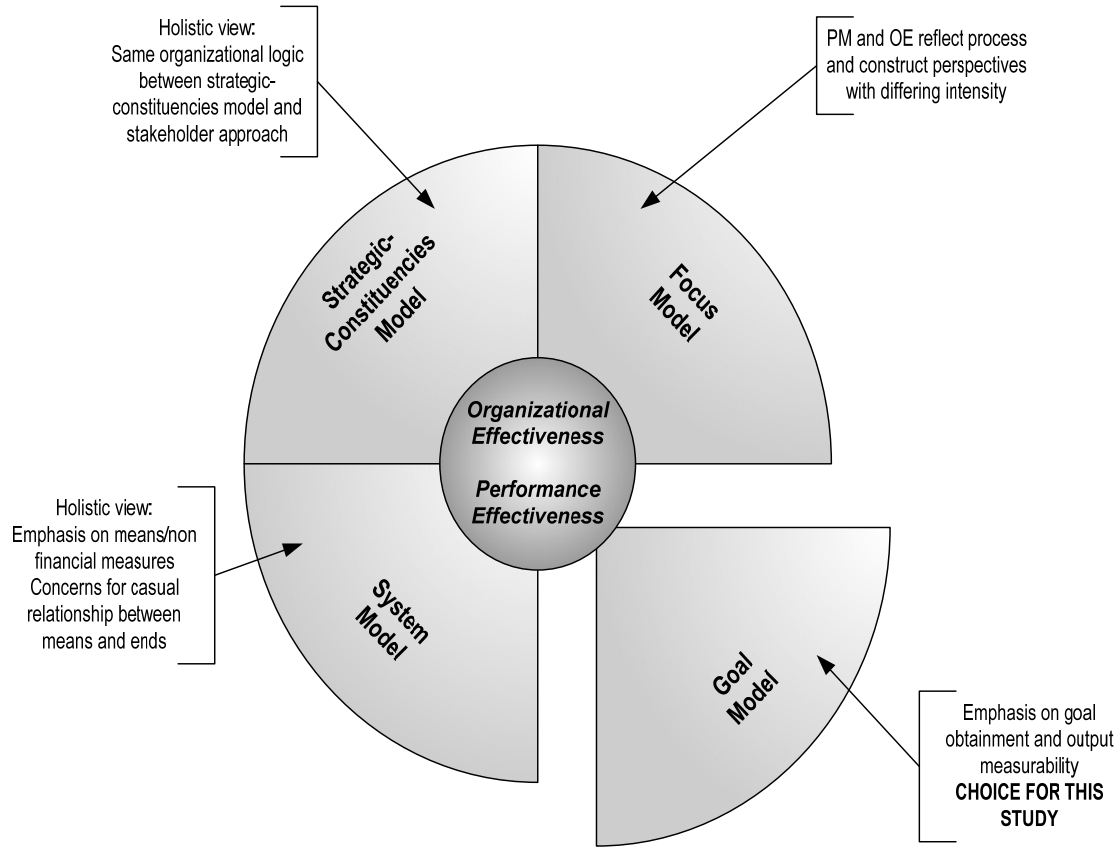



*Figure 2.1.* Primary Theory Groups of Team Effectiveness (adapted from Henri, 2004, p. 113)

This study's choice of team effectiveness reflects the goal model. The emphases of the dependent variables of the study were goal obtainment and

output measurements. Specific effectiveness goals are reviewed later in the chapter.

*Performance Measurements in Manufacturing*

Performance management has been the subject of academic study for 25 years (Eccles, 1991; Johnson & Kaplan, 1987; Kaplan & Norton, 1992; Lynch & Cross, 1991; Thorpe, 2004). Neely (1999) estimated that 3,615 articles on performance measurement were published between 1994 and 1996 in the United States alone. A more recent study carried out at Cranfield University also highlighted the interest in this subject of inquiry (Franco & Bourne, 2003). Recent research efforts have identified leadership involvement and employee collaboration as facilitators of increased productivity (Busi & Bititci, 2006; Collins & Schmenner, 2007; Stansfield & Longenecker, 2006). As a result of the aforementioned research, some researchers argued that performance measurements provide an effective way to increase the competitiveness and profitability of the organization within the manufacturing environment (Kaplan & Norton, 2004; Moullin, 2004; Niemira & Saaty, 2004; Robson, 2004).

*Balanced Scorecard / Key Performance Indicators*

Covey (1989) suggested that performance measures must provide timely, relevant, and accurate feedback from both long-term and short-term perspectives. He went on to posit that measurement should be accomplished by a limited number of performance measures that include some non-financial measures. Recognizing the balance between production and production potential and the relative nature of any organizational effectiveness measurement, the

Balanced Scorecard method (BSC) / Key Performance Indicator (KPI) is widely used in the manufacturing environment. Neely (2003) reported that the Lastes Gartneer research organization found that over 70% of large U.S. firms had adopted the Balanced Scorecard by the end of 2001. In a 2006 study, a Bain and Company survey of more than 708 companies on five continents found that the Balanced Scorecard was used by 62% of responding organizations (Rigby & Goffinet, 2007).

The Balanced Scorecard (BSC) concept was initially developed in 1992 by Robert Kaplan and David Norton. They suggested that the old paradigm of reliance on financial measures tended to reveal only past events and had occasionally proved inadequate in situations faced by companies in today's information age. The authors indicated that the BSC is *balanced* between objective outcome measures and subjective performance drivers of outcome measures (Kaplan and Norton, 1992). As organizations construct BSC measurables, the emphasis is on cause and effect and deployed to drive organizational change. A number of authors have acknowledged the BSC as an effective performance measurement tool (Berkman, 2002; Gumbos & Lyons, 2002).

The BSC measurable and Key Performance Indicators (KPIs) are similar and often used interchangeably in business and industry. KPIs can be financial or non-financial metrics used to quantify objectives to reflect the strategic performance of an organization. KPIs define a set of values used to measure against. The raw sets of values that are entered into the KPI system are

summarized against the indicators. KPIs are typically tied to an organization's strategy. When identifying the KPIs, the acronym SMART is often applied. SMART denotes goals that are specific, measurable, achievable, realistic, and timely. Interplay between the BSC method and the KPI method are indistinguishable in most manufacturing environments. The company that provided the data for this study refers to effectiveness goals by both the KPI and BSC labels. This study employed the BSC / KPI method as the dependent variables of performance measures were identified.

## Selection of BSC / KPI Measurables for the Study

A review of the literature shows that traditional performance measurement systems (based on traditional financial measures) have failed to identify and integrate the critical factors that contribute to business excellence (Eccles, 1991; Fisher, 1992; Kaplan, 1984; Maskell, 1992). The skills of employees are company assets just like tangible assets therefore, employees with fundamental skills are an important source when organizations seek to raise capabilities and profits (Porter, 1985). Examinations of employee-driven measures are important and should be a focal point of a leader's attention (Porter & Stern, 2001). In studies focusing on manufacturing organizations, effective teams report benefits that include increased productivity, lower attrition rates, and increased quality while maintaining a safe work environment (Manz & Sims, 1987).

The BCS / KPI performance measurable system provided the framework for this study's dependent variables. The performance indicators for this study were taken from typical manufacturing BSC / KPI measurements and included:

absenteeism, attrition, accident frequency, accident severity, and defective parts produced. The current study recognized that correlative findings involving servant leadership and team effectiveness within business and industry that did not feature the BSC / KPI generated goals would be rendered inconsequential and insignificant within the manufacturing leadership community. Much of the development of leadership theory within the manufacturing segment is predicated on the belief in the interplay between leadership and goal achievement. Goal achievement is measured in the study by the five dependent variables of team effectiveness. These dependent variables provide a would-be competitive advantage in most manufacturing environments. The value and relevancy of these effectiveness measures are examined below.

*Accident Frequency and Severity*

Research into how management can influence the prevention of accidents and impact the severity of accidents is important. Research has supported the notion that leaders can affect safety results (Zohar, 2002). The current research project provides empirical data when considering a leader's role in safety and the resulting benefits.

Within the manufacturing environment, accident frequency and severity have implications related to profitability. The U.S. Department of Labor (DOL) provides an interactive web site highlighting this actuality (US.DOL, 2007). An example of the financial impact of four recordable accidents is detailed in Appendix A. The table in Appendix A details the negative profitability effect of

four accidents and the need for additional sales of between $465,215 and $723,076 to offset the harmful financial impact.

*Attrition*

Firms that focus on their specific human resource advantages by attracting and retaining highly skilled human capital increase their competitive potential in markets (Chadee & Kumar, 2001). Dressler (2005) used a web-based survey to gather data regarding the cost of turnover. The findings placed the total cost of turnover at $5,700 for workers with low-complexity jobs and almost $10,000 for high-complexity jobs. The effect on profitability is obvious. The current study will contribute to the understanding of leadership influence in the process of reducing employee attrition.

*Absenteeism*

Absenteeism is viewed as a measure of team effectiveness in most countries (Goodman & Pennings, 1977). Literature investigating the causes of absenteeism has identified management style as an important factor (Nicholson, 1977; Steers & Rhoads, 1978). In the competitive manufacturing environment, absences can have considerable economic consequences for individual organizations. At a time when an ever increasing number of employees telecommute or work in virtual offices, manufacturing still relies on attendance at the manufacturing facility to meet daily production requirements. Reduction in absenteeism provides a potential competitive advantage in most manufacturing environments.

*Defective Parts Produced*

Evidence from the growing literature on quality failures has emphasized the neglect of the human side of quality management in that the human resources and organizational behavioral aspects of quality management are not given their deserved emphasis (Lowery, 2000; Wilkinson, 1998).

Over the past 25 years, quality has been viewed as the source of competitive advantage (Forker & Vickery, 1996). The management of quality is a critical component in the design and production of products that are superior to those of a competitor. The role that leaders play in securing quality parts is an important area of research for business and industry. Maintaining the quality of each produced part allows organizations to remain competitive in today's global environment.

## Leadership Theory Inquiry

Leadership theories have evolved from studies of whom the leader was to discussions about what the leader did to, finally, reviews of the environment in which leadership takes place. As leadership theory was developed and empirical studies undertaken, followers have come to the forefront of researcher interest. With regard to the present study, followers were an important consideration when selecting the specific leadership theory for examination. The leadership theory review that follows will rationalize the specific selection of the leadership theory/model used in this project.

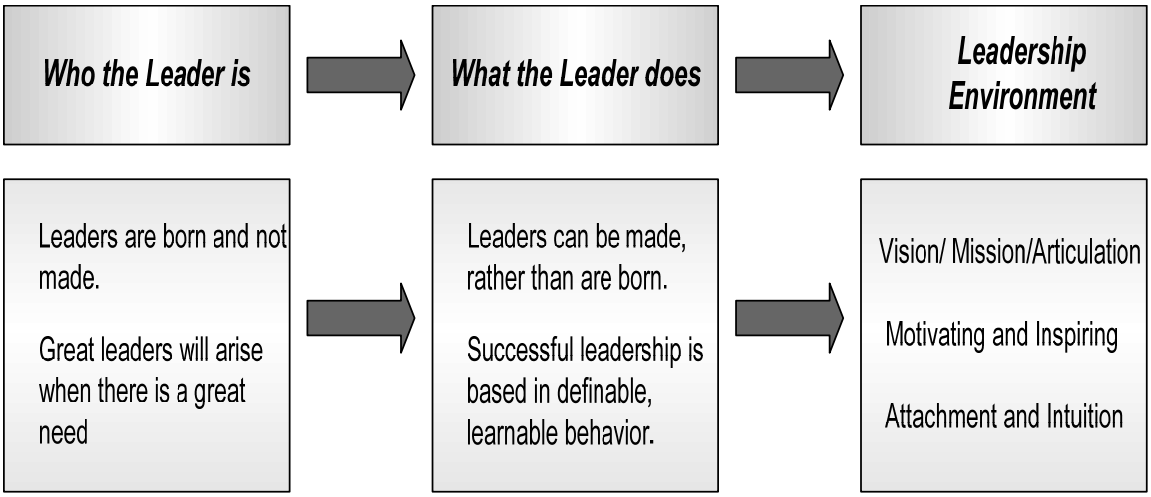



*Figure 2.2.* Macro View of Leadership Theory Groupings

*Great Man Theory*

Early leadership studies concentrated on research that involved the examination of the privileged minority. Aristocratic and cultural elites were thought to possess an inherent brilliance that the masses could only view from a distance. Women were also excluded from consideration in early leadership theory inquiries.

*Trait Approach Theories*

Great man leadership philosophies were soon abandoned as researchers went further and considered the likelihood that certain characteristics separated leaders from non-leaders. Leadership trait researchers posited that instinctive qualities were inherited rather than nurtured. Trait theorists believed that characteristics were stable over time and across a variety of situations. Lussier and Achua (2004) stated that “leadership trait theories attempt to explain distinctive characteristics accounting for effective leadership” (p. 15). Northouse (2007) suggested that the lack of research in examining leader-follower

interaction was one of the major reasons for the failure of trait theory investigations.

Zaccaro, Kemp, and Bader (2004) recently revealed a renewed interest in trait leadership studies by leadership researchers:

> The charismatic leadership research paradigm, together with the recent meta-analysis reviews, new rotation designs, and longitudinal studies of managerial advancement, have contributed to a revitalization of the leader trait model (p. 109).

*Behavioral Approach Theories*

The absence of convincing research leading to a universal trait-oriented form of leadership influenced researchers to consider styles of effective leadership (Yukl, 2002). The substantial variation between trait and behavior research was the focus on the leadership behaviors or attitudes of leaders as opposed to an examination of the individual traits of leaders. For the first time, relational components of leadership came under review and consideration.

Behavioral approach theories focused on positive leadership behaviors and the effect that these had on the followers. A clear example of the potential of positive leadership behavior occurred in 1916 when Ernest Shackleton and his crew survived two years stranded in the Antarctic. Shackleton received recognition for offering leadership behaviors that influenced the crewmembers as they survived the unforgiving conditions (Morrell & Capparell, 2001).

*Managerial Grid Theory*

Blake and Mouton extended the earlier University of Michigan and Ohio State University behavioral theory concepts and posited that leaders could use task-oriented and relationship-oriented behaviors in tandem to realize the greatest benefit (Figure 2.3). Yukl (2002) observed that Blake and Mouton's managerial grid theory was the only approach that was investigating the relationship between behaviors and leader concerns. Blake and Mouton followed the theme of leader behaviors as they constructed the managerial grid theory.

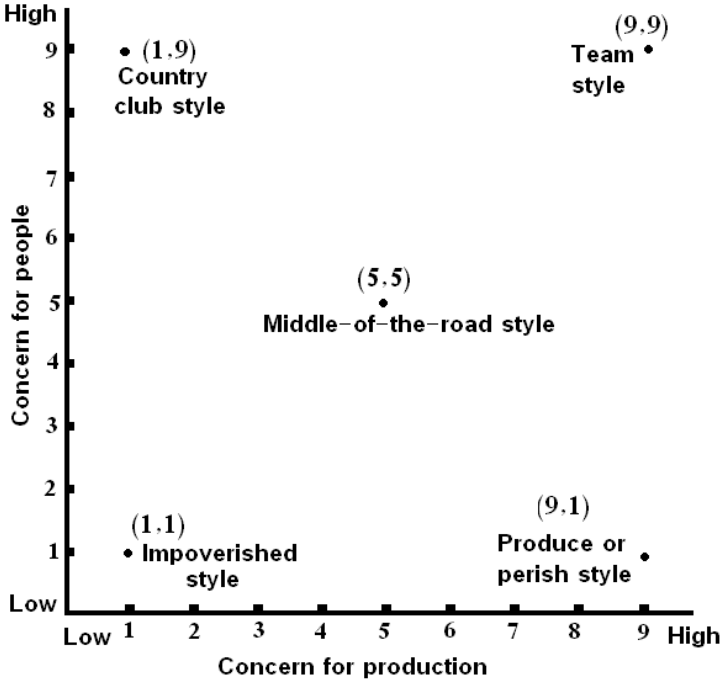



*Figure 2.3*. Blake-Mouton Leadership Grid (Blake & McCanse, 1991)

While the research community has tended to discard behavioral leadership theories, recent comprehensive quantitative research by Judge, Piccolo, and Ilies (2004) indicated that measures of consideration for followers and structure of

production concerns had significant relationships with various events that were associated with effective leadership.

Leadership research continued to evolve as focus shifted from leader behaviors and traits to the consideration of contingency factors and situational variables as causal components of effective leadership (Lussier & Achua, 2004). The premise of the contingency theory was the value attributed to determining the appropriate fit between leadership styles and contextual situations (Northouse, 2001).

*Contingency Approach Theories*

Several contingency approach theories originated in the 1950s and 1960s, but the foremost theory came from the work of Fiedler (Bass, 1990, p.46-47). Fiedler's approach departed from trait and behavioral models by asserting that group performance is contingent on the leader's psychological orientation and on three contextual variables: group atmosphere, task structure, and the leader's power position.

Robert House added to the research on the contingency theory approach as he developed the path-goal theory in 1971. Northouse (2001) described the path-goal theory as a leadership approach that endeavors to achieve extrinsic rewards by reinforcing change in followers' behaviors through interaction with their leader. Northouse posited that the intention of the theory was to enhance employee performance and employee satisfaction through employee motivation. The path-goal theory has two assumptions. First, if followers correlate their job satisfaction with the leader's behavior, then the behavior could influence the

follower's satisfaction upon acceptance of the leader's behavior. The second assumption was that leadership behavior could inspire and motivate (Silverthorne, 2001). A criticism of the path-goal theory is that the model failed to offer adequate information on how leaders should implement the different styles of leadership relative to the needs of specific employees.

*Leader-Member Exchange Theory*

Empirical evidence within the examination of contingency theory pointed to the importance of the leader-follower relationship, and this gave rise to the development of the leader-member exchange theory (LMX) which targets the relationship between leaders and followers (Lussier & Achua, 2004). Yukl (2002) stated that the premise of the LMX theory was that "leaders develop a separate exchange relationship with each individual subordinate as the two parties mutually define the role of the subordinate" (p. 116). Two forms of leadership emerged from the social exchange relationship. The relationship between in-group members forms one group, and the second group featured a relationship with out-group members. The relationship with the in-group was a relatively high-level relationship between the leader and those certain followers who became the trusted confidants of the leader. The relationship with the out-group featured a transactional and somewhat detached connection with the leader. The in-group followers have a special relationship with the leader and receive more benefits and rewards than out-group receive. LMX theory was another example of the contingency approach related to the importance of the examination of follower needs and involvement. One of the criticisms of the LMX theory, however, is that

the theory divides the work unit into two groups and supports the development of privileged groups, which can introduce an appearance of unfair practices and discriminatory activity (Northouse, 2001).

*Transformational Theory*

By the 1970s it was clear that leadership theory development had undergone a fundamental shift in focus from the significance of the leader to the consideration of the involvement of the follower in facilitating organizational effectiveness. The shift from leader-focused theory to the development of a follower-focused transformational leadership theory recognized this actuality.

Burns (1978) offered his definition of transforming leadership when he wrote that “the transforming leader recognizes and exploits an existing need or demand of a potential follower” (p.4). Yukl (2002) defined transforming leadership as an approach by leaders who appealed to the morality and consciousness of followers to conform to ethical issues and collectively reform the organization. Bass (1990) contrasted transformational leadership with transactional leadership, stating that transactional leaders influenced followers’ behavior through exchange of rewards for compliance and cooperation (p. 23-24). Northouse (2007) suggested that one of the strengths of transformational leadership was the focus on follower needs, values, and morale.

Its strengths notwithstanding, transformational leadership is not without criticism. Gibson and Pason (2003) contended that transformational leadership and similar theories that fail to emphasize the skills and attitudes of followers could result in leadership manipulation and unethical practices. With the

development of transformational leadership, the evolution of leadership inquiry continued to move away from earlier consideration of leader traits and actions.

*Servant Leadership Theory*

Servant leadership theory built upon transformational leadership principles but highlighted an important distinction. Servant leadership is not based on the paternalistic empowerment model of the past. Leaders recognize the collaborative nature of leadership in terms of listening first and respecting followers.

In *The Servant as Leader,* Greenleaf (1970) provided a description of this original theory when he wrote:

> It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. The difference manifests itself in the care taken by the servant—first to make sure that other people's highest priority needs are being served, become healthier, wiser, freer, and more autonomous, more likely themselves to become servants. (p.13)

In Greenleaf's 1977 book, *Servant Leadership,* he enhanced his description of the servant leadership when he proposed that the seminal component of this leadership is in the leader's perception from the outset that he or she is a servant. The exertion of the follower's will and the impact of this in supporting positive organizational change is a key component of the servant leadership concept.

The servant leadership model proposed by Greenleaf in the mid-to-late 20th century inverted the role of traditional leadership from an emphasis on top down autocratic and directive leadership styles to democratic and participative leadership styles. While honoring the needs of followers, servant leaders emphasize integrity, morals, and ethics within the organization (Covey, 2006; Russell, 2001).

*Selection of the Servant Leadership Variable*

The preceding review of literature revealed that past management structure assumed that leaders would control all elements of an operation. Leaders were responsible for planning, organizing, staffing, controlling, and directing. Past management arrangements tended to create a culture in which employees shared problems with leaders, leaders provided direction, and management directed the employees. Leader motivation of followers seemed to favor the contingent reward systems that usually involved position upgrades or wage increases.

More recently, the paradigm shift in leadership theory is from management control to new consideration of the potential of the abilities and talents of individuals. Current leadership theory has increasingly pointed to the importance of the follower in consideration of team effectiveness. The Gallup organization interviewed over 2,500 businesses and empirically determined that what it referred to as "employee engagement" was a significant predictor of desirable organizational outcomes such as customer satisfaction, retention, productivity, and profitability (Buckingham & Coffman, 1999).

The importance of leaders notwithstanding, findings have pointed to a leader attribution error of assigning causal effect within organizational achievement. In “What Makes for a Great Team,” Hackman (2004) concluded that the pervasive focus on the team leader in explaining team performance may not be accurate. This conventional input-process-output model, in which causality flows linearly from left to right and step by step may not be the primary driver of effectiveness. Hackman concluded that the evidence indicated that, in some circumstances, causality flows in the opposite direction. During the compilation of this literature review, it became apparent that the servant leadership closely aligns with current leadership thought and research (See Figure 2.4).

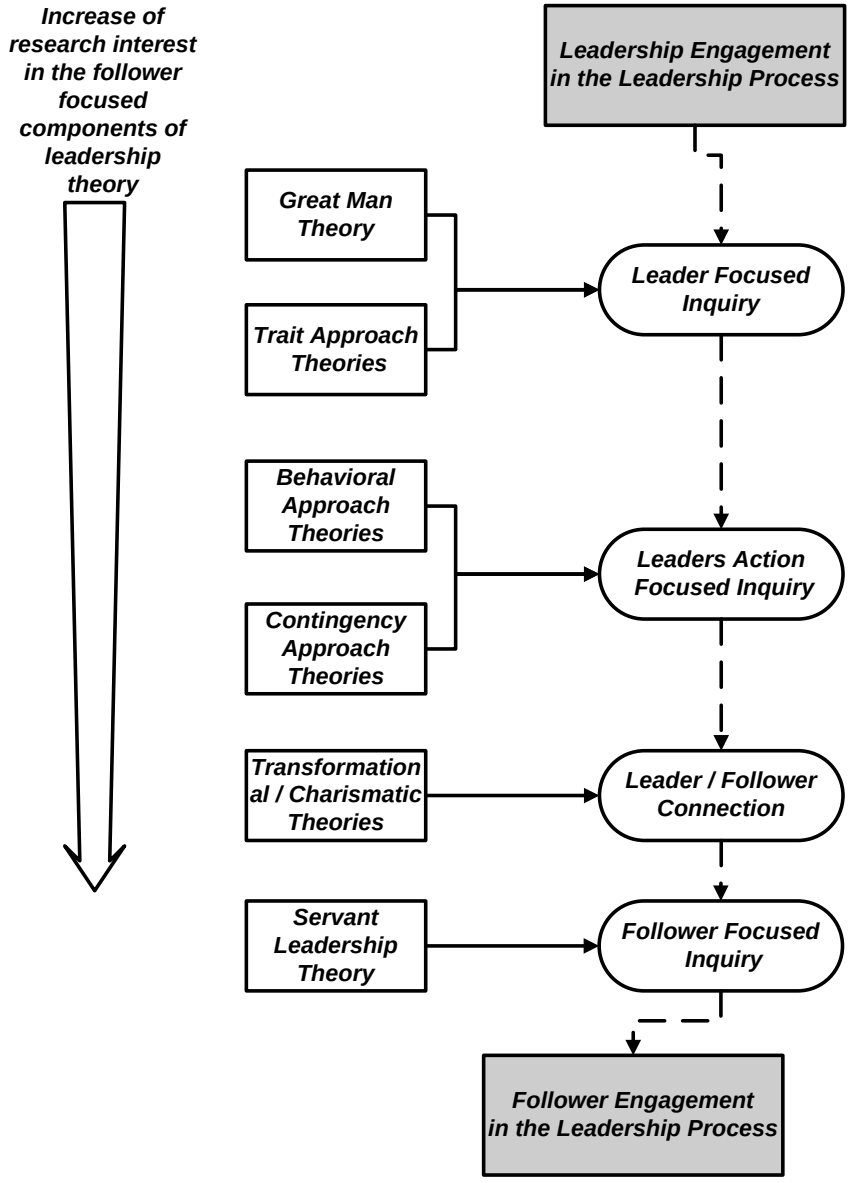



*Figure 2.4.* Leadership Theory Development.

The next section of the literature review provides a narrower focus and develops a more extensive examination of servant leadership.

## Conceptual Model of Servant Leadership

In the late 1960s, Robert Greenleaf's interaction with students at several universities introduced him to the works of Hesse. In an attempt to better understand contemporary college students, Greenleaf read Hesse's novels and biography, including *Journey to the East* (1956). Greenleaf fashioned many of his thoughts on servant leadership through his reactions to his readings of the novelist-philosophers Hermann Hesse as well as Albert Camus.

*Journey to the East* follows a group of travelers who are on a difficult journey. The group disbands after their servant Leo is separated from the unit. Later, as the group reflects upon the journey and contemplates what went wrong, they recognize that it was Leo, their servant, who provided the leadership, and they ultimately agree that his absence from the group led to the expedition's undoing. This recognition that a servant was the leader of the group was the basis for Greenleaf's development of his servant leadership theory. Hesse's description of Leo's servant leadership behaviors illustrates the foundation of Greenleaf's original leadership approach.

> Leo went on ahead, and again, as I did many years ago when I watched him and the way he walked, I had to admire him as a good and perfect servant. He walked along the lanes in front of me, nimbly and patiently, indicating the way; he was the perfect guide, the perfect servant at his task, the perfect official. (Hesse, 1956, p.83)

Leo, as the ideal servant-leader, resonated in the development of Greenleaf's theory and seemed to provide inspiration.

Another central element of his innovative servant leadership theory resulted from Greenleaf's attraction to the writings of the Algerian-French author/philosopher, Albert Camus. Camus spoke of the powerful nature of self expression and the transformational potential within all people. In his own work, Greenleaf (1977) quoted the last paragraph of Camus's 1961 speech, "Create Dangerously."

> Some will say this hope lies in a nation, others, a man. I believe rather that it is awakened, revived, nourished by millions of solitary individuals whose deeds and works every day negate frontiers and the crudest implications of history. As a result, there shines forth fleetingly the ever-threatened truth that each and every man, on the foundations of his own sufferings and joys, builds for them all. (p. 12)

Greenleaf endorsed Camus's view of individualism and the notion that creative capacity exists within everyone. This energy from the individual became an essential component of Greenleaf's theory in the servant leadership model. Greenleaf continued to develop his hypothesis in the framework of his research on organizational leadership and resulting lectures at leading universities.

Through his research and examination of leadership, Greenleaf challenged the widely held acceptance of the authoritarian notion of leadership. Moreover, Greenleaf challenged the long held view of the subservient nature of followership. As the architect and chief advocate of the servant leadership faction, Greenleaf was unrelenting as he expounded the virtues of this new and

as-of-yet untested leadership theory. Greenleaf's theory led to a distinct and fresh contrast when compared to traditional leader characteristics (Table 2.2).

Table 2.2.

*Comparison of Traditional and Servant Leader Characteristics*

| Traditional Leader | Servant as Leader |
|---|---|
| Motivation: personal drive to achieve. | Motivation: desire to serve others. |
| Highly competitive; independent mindset: seeks to receive personal credit for achievement. | Highly collaborative and interdependent: gives credit to others generously. |
| Understands internal politics and uses them to win personally. | Sensitive to what motivates others and empowers all to win with shared goals and vision. |
| Focuses on fast action. | Focuses on gaining understanding, input and buy-in |
| Relies on facts, logics, proof. | Uses intuition and foresight to balance logic, facts, proof. |
| Controls information to maintain power. | Shares information generously. |
| Spends more time telling and giving orders. | Listens deeply and respectfully to others. |
| Believe that personal value comes from individual talent. | Feels that personal value comes from mentoring and working collaboratively with others. |
| Sees network of supporters as power base, and perks and titles as a signal to others. | Develops trust across a network of constituencies; breaks down hierarchy. |
| Eager to speak first; dominant speaker; feels ideas are superior; may intimidate. | Most likely to listen first; values others' input. |
| Uses personal power and intimidation to leverage what he or she wants. | Uses personal trust and respect to build bridges and do what's best for the "whole." |
| Accountability is more often about whom to blame. | Accountability is about making it safe to learn from mistakes. |
| Uses humor to control others. | Uses humor to lift others up and make it safe to learn from mistakes. |

Note: Adapted from McGee-Cooper and Trammel, 2002, pp. 145-146

With the death of Greenleaf in 1990, the development of his leadership theory passed to his contemporaries and the call for empirical research increased. An initial challenge for the researchers was that many foundational documents were in the form of short essays and at the time of his death, were unpublished. The fact that many works were published posthumously did not allow for important dialogue or supplementary explanation from Greenleaf with regard to his intent.

Servant leadership theory is sometimes dismissed as an unproven theory due to its incomplete development by its creator, insufficient research, and uncertain definition of the key components. Servant leadership theory has tended to suffer from an identity crisis, and this has been problematic in the development of this theory.

Much of the early empirical curiosity within the servant leadership community centered around the reductionist approach to component classification and theory development (Buchen, 1998; Dennis & Winston, 2003; Farling, Stone & Winston, 1999; Laub, 1999; Page & Wong, 2000; Patterson, 2003; Russell, 2001; Spears, 1998). While Spears (1998) provided the primary keystone piece on servant leadership component identification, as shown in Table 2.3, a number of foundational studies provided the early framework for discernment of the servant leadership model components. The development of component classification gave way to researchers who provided foundational empirical testing of the newly identified servant leadership traits (Barbuto & Wheeler, 2006; Bocarnea & Dennis, 2005; Dennis & Winston, 2003; Hoshaw,

1985; Joseph & Winston, 2005; Perkins, 1988; Sullivan, 1994; Van Kuik, 1998; Walker, 1997; Woodward, 1988).

Table 2.3.

*Servant Leadership Theory Component Development*

| Publication Year | Author(s) | Components |
|---|---|---|
| 1998 | Spears | Empathy, Healing, Listening, Awareness, Persuasion, Foresight, Conceptualization, Commitment, Stewardship, Community Building |
| 1999 | Faring, Stone, and Winston | Vision, Trust, Service, Influence, Credibility |
| 1999 | Laub | Valuing People, Developing People, Building Community, Displaying Authenticity, Providing Leadership, Sharing Responsibility |
| 2001 | Russell | Vision, Trust, Empowerment, Credibility, Modeling, Pioneering, Appreciation of Others, Service |
| 2003 | Patterson | Agapao Love, Trust, Vision, Service, Empowerment, Altruism, Humility |

Many in the servant leadership community have accepted the servant leadership components contained within the Laub (1999) framework. Laub's approach offered valuing people, developing people, building community, displaying authenticity, providing leadership, and a sharing leadership as the dimensions of his servant leadership definition (see Table 2.4). From this basis, Laub developed the Organizational Leadership Assessment (OLA) as a measurement instrument to appraise servant leadership at the organizational level. The formation of Laub's OLA resulted from his 1999 research that utilized a

Delphi method for trait identification, and his research also provided validation of his new OLA instrument.

Table 2.4.

*Components and Sub-Headings for Servant Leadership* (Laub, 2007).

| Valuing people | Developing people |
|---|---|
| Serve others first | Provide for learning |
| Believe and trust in people | Model appropriate behavior |
| Listen receptively | Build up through affirmation |
| **Display authenticity** | **Build Community** |
| Open and accountable | Build relationships |
| Willing to learn | Work collaboratively |
| Honesty and Integrity | Value differences |
| **Share Leadership** | **Provide Leadership** |
| Share the vision | Envision the future |
| Share the power | Take initiative |
| Share the status | Clarify goals |

While the Laub servant leadership components and OLA instrument are widely used in the examination of servant leadership, other researchers have recently authored important empirical examinations of servant leadership components. Dennis (2004) conducted an empirical study to construct and validate an instrument that could measure the concepts of servant leadership as

defined by Patterson (2003). Patterson's constructs for servant leadership identified the components of *agapao* love, acts of humility, altruistic values, vision for the followers, trust, service, and empowerment to followers. His study involved an abbreviated Delphi survey and resulted in the development of the Servant Leadership Survey (SLS) instrument. Dennis concluded that his study's exploratory factor analysis helped define and characterize the underlying structure of Patterson's theory. Dennis called for future research in the form of a confirmatory factor analysis to establish construct validity and recommended that a structural equation modeling (SEM) analysis also be undertaken to help establish validity (Dennis, 2004). Barbuto and Wheeler (2006) recently provided a means to conduct empirical research on servant leadership with their development of the Servant Leadership Questionnaire (SLQ). They conducted a factor analysis and developed a servant leadership construct which represented five distinct factors: altruistic calling, emotional healing, organizational stewardship, persuasive mapping, and wisdom. In a validation study by Barbuto and Wheeler (2006), the reliabilities of the self-version's subscales ranged from .68 to .87, and from .82 to .92 for the rater version.

Servant leadership proponents share a common belief that leadership is a relationship and not merely a set of attributes or traits. This echoes the early writings of McGregor (1960) when he posited that leadership is not a property of the individual but a complex relationship between the leader and the attitudes and needs of the followers.

*Criticisms of Servant Leadership Theory*

It should be noted that Greenleaf (1977) himself acknowledged that servant leadership possessed concepts that might be difficult to apply:

> What I have to say comes from experience, my own and that of others, which bears on institutional reconstruction. It is a personal statement, and it is meant to be neither a scholarly treatise nor a how-to-do-it manual. (p.49).

From this acknowledgement, servant leadership research has developed.

Despite the growing recognition of servant-leadership and a marked increase in research efforts, the theory lacks widespread empirical examinations. Bowman (1997) pointed out that although a significant amount had been written about servant leadership, the work is not supported by an abundance of wide-ranging empirical research. He added that while several authors on the subject of servant-leaders provide examples of servant-leadership in organizational settings, the majority are anecdotal. Servant-leadership research continues but has been viewed by some as being difficult to apply. Berry and Cartwright (2000) called servant leadership idealistic and implied that corporations in America would not embrace the leadership theory because of the undertones that the concept of service to others infers. They speculated that servant leadership was inappropriate for Western corporations because they are engaged in concerns of short term results and shareholder oversight. Still other writers have argued that Greenleaf's theory is unrealistic and very unorthodox (Neuschel, 2005; Quay, 1997).

Regarding the term *servant leadership* itself, negative connotations have been associated with the use of the word *servant*. Bowie (2000) observed that in some settings, servant leadership may encourage followers to take advantage of their empowered state. Bowie went on to posit that the term *servant* does not embody the intent of the servant leadership model.

Wells (2004) was critical of servant leadership on the basis of its conflict with basic human nature. Wells wrote that human beings lack the ability to remain firm in service to others because the problem of sin has transformed would-be servants into egocentric, self-seekers. Wells posited that servant leadership takes a Unitarian approach to God that leaves out the salvific work of Jesus. He goes on to state that Greenleaf took an existential approach to anthropology and viewed transformation as a self-determined and self-directed activity. Wells believed that servant leadership constructs rely on self sufficiency, not on Trinitarian-driven transformation. It should be noted that the Well's criticisms may have been based on a specific religious orientation.

## Gaps in the Literature

While important research has been undertaken recently within the organizational leadership community (Iken, 2005; Joseph & Winston, 2005), an identified gap in servant leadership literature has been the unbalanced focus of empirical inquiry in favor of not-for-profit (NFP) organizations, especially within the spiritual and educational sectors (Dillman, 2004; Drury, 2004; Hebert, 2003; Hoshaw, 1985; Irving, 2005; Sullivan, 1994; Van Kuik, 1998; Walker, 1997; Woodward, 1988). This inclination toward the NFP sector could lead some

researchers to conclude that servant leadership theory assessment is somewhat contextually constrained.

In his 2005 study, Irving provided one of the few empirical examinations that offered a glimpse into the relationship between servant leadership and team effectiveness in the for-profit business sector. Although the primary focus of Irving's effort centered on the NFP sectors, he did venture into the business segment. In Table 2.5, the Irving "n" value within the business section of his study is identified. While the Irving business sample was limited and failed to reach statistical significance, it was important and his research resulted in a tentative finding of correlation (Table 2.5). Irving's preliminary work within the business sector would benefit from more extensive investigation.

Table 2.5.

*Irving Correlation Coefficients of Servant Leadership and Team Effectiveness (Irving, 2005)*

| Group | N | Pearson r | Significance |
|---|---|---|---|
| Entire Sample | 202 | .592 | .000 |
| Non Profit | 22 | .547 | .008 |
| Church | 165 | .563 | .000 |
| Business | 15 | .758 | .001 |

Business and industry have historically been under-represented in examinations of servant leadership theory, and this lack of empirical data has allowed business decision-makers to easily dismiss the basic servant leadership

premise. The need for more research in the NFP sector notwithstanding, the current study presents an examination of servant leadership in the business segment. The current research project used two variables of interest: the concentration of servant leadership within business and industry and the level of team effectiveness within the same business and industry setting. By providing such data, the intention of this study was to offer a better understanding of the correlation, or lack thereof, between servant leadership behaviors and team effectiveness.

## Chapter Conclusion

Guillory (2007) suggested that organizations are now in the “age of connectedness” and that power is based upon cooperation (See Figure 2.5). This idea is being advanced through empirical evidence from researchers. This “age of connectedness” places more emphasis on the necessities of authenticity (George, 2003), consciousness (Chatterjee, 1998), ethics (Kanungo & Mendonca, 1996), humanism (Seligman, 2000), and spiritual maturity (Bolman & Deal, 2001; Sanders, Hopkins & Geroy, 2003; Vaill, 1998). These “age of connectedness” components and the components within servant leadership share a commonality and appear to have shared aims.

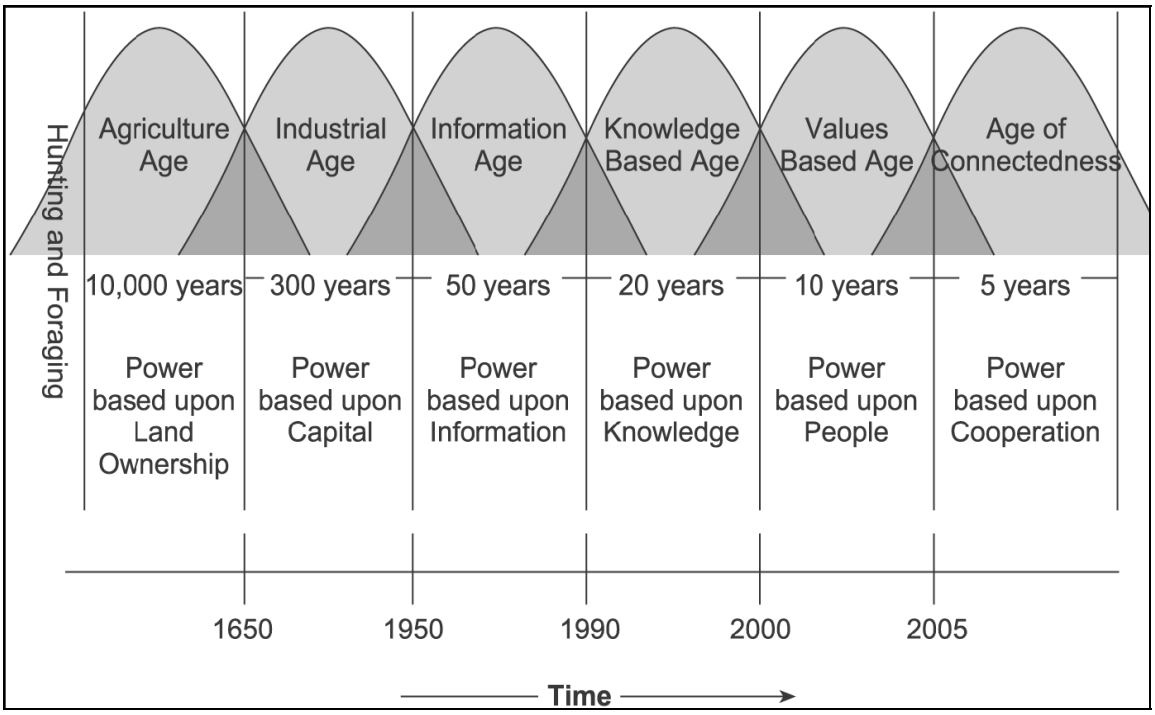



*Figure 2.5.* Global and Societal Business Paradigms (Guillory, 2007)

The current age of connectedness that is portrayed by Guillory emphasizes the follower and consequently, the leader's need to engage the follower. At the very least, mutual influence in facilitating performance and organizational effectiveness is understood within many leadership circles. Shared or distributed leadership emphasizes the importance of the development of employee abilities and engagement. The shared or distributed leadership allows the employee to take initiative, embrace risk, stimulate innovation, and cope with uncertainty (Spreitzer, 1995).

In a recent study of plant performance variables, respondents were asked to indicate the five most important items for improving plant performance at the present time and into the future. A list of 15 items was provided and respondents had an opportunity to add others to the list if they felt it appropriate (Collins & Schmenner, 2007). The survey results suggested that high-performing plants are

differentiated from under-performing plants by plant management that shows a clear commitment to the attitude and mindset of the plant employees, labor relations that are cordial and constructive, and leadership that displays strong people skills (Table 2.6).

Table 2.6.

*Contributors to Improved Plant Performance* (*Collins and Schmenner, 2007, p. 270)*

| | To Date | | In the Future | |
|---|---|---|---|---|
| | Percent | Rank | Percent | Rank |
| New attitude or mentality at plant | 61.3 | 1 | 40 | 5 |
| Improving workforce training, morale | 54.1 | 2 | 54.7 | 1 |
| Re-engineering plant | 47.9 | 3 | 29.7 | 9 |
| Breaking key bottlenecks | 41.9 | 4 | 26.1 | 1 |
| Reducing throughput time | 41.9 | 4 | 52 | 4 |
| Increasing yields, improving quality | 40.5 | 6 | 29.7 | 9 |
| Increased factory focus | 38.4 | 7 | 32.4 | 8 |
| Improving supply chain management | 36.5 | 8 | 52.7 | 3 |
| Replacing older equipment | 31.5 | 9 | 20.3 | 14 |
| Six Sigma /other improvement initiatives | 31.1 | 10 | 35.1 | 7 |
| Running existing equipment harder | 30.71 | 11 | 20.3 | 14 |
| Standardizing production specifications | 30.1 | 12 | 38.4 | 6 |
| Increasing product variety produced | 19.4 | 13 | 16.7 | 16 |
| Removing direct labor | 17.8 | 14 | 20.5 | 13 |
| Better MRP and ERP systems | 11 | 15 | 21.9 | 12 |

From the Guillory “age of connectedness” to the recent Collins and Schmenner findings regarding the importance of engaging followers, evidence is

surfacing that the deeply-embedded cultural assumptions about the nature and purpose of leadership, teams, and work are changing and being viewed from a new perspective. The effect of the long held “scientific management” assumptions related to the absolutes of standardization, stability, continuity, expectedness, and control are being questioned within the workplace. Diversity, creativity, adaptation, and change are replacing the historical legacy of past leadership generations.

The fundamental tenet of servant leadership theory is an acknowledgement of the significance of the followers within an organization. The study adds empirical research to servant leadership as concerns about employee engagement continues to plague U.S. businesses. Researchers have claimed that employee engagement predicts employee outcomes, organizational success, and financial performance (Bates, 2004; Baumruk, 2004; Richman, 2006). An increased level of disengagement among employees has been reported (Bates, 2004; Richman, 2006). This “engagement loss” is projected to cost U.S. businesses $300 billion a year in lost productivity (Kowalski, 2003). The servant leadership emphasis on the importance of the follower, coupled with the emerging emphasis on employee-focused leadership practices point to a need to more fully investigate the effectiveness of servant leadership.

In addition to the need for increased empirical examination of servant leadership, the current study will offer supplementary evidence in the under-researched business and industry segment of servant leadership study. Earlier servant leadership research focused on NFP organizations, and this created a

clear and present gap in the empirical evidence. The current study is intent on adding to the understanding of the importance, or lack of importance, of servant leadership in relation to team effectiveness in business and industry.

# CHAPTER 3

## METHOD OF RESEARCH

The method of research that was selected for this study reflected an established understanding of the research process. The task was to classify, assemble, and process the data and make meaning of their configuration. The intent was to produce a reading that accurately represented the raw data and blended them into a meaningful account of the measurements (Weiss, 1998).

As shown in Figure 3.1, Chapter 3 offers a conceptualization of the research study, research methods, identification and explanation of the dependent and independent research variables, and a discussion related to the selection of measurement instruments.

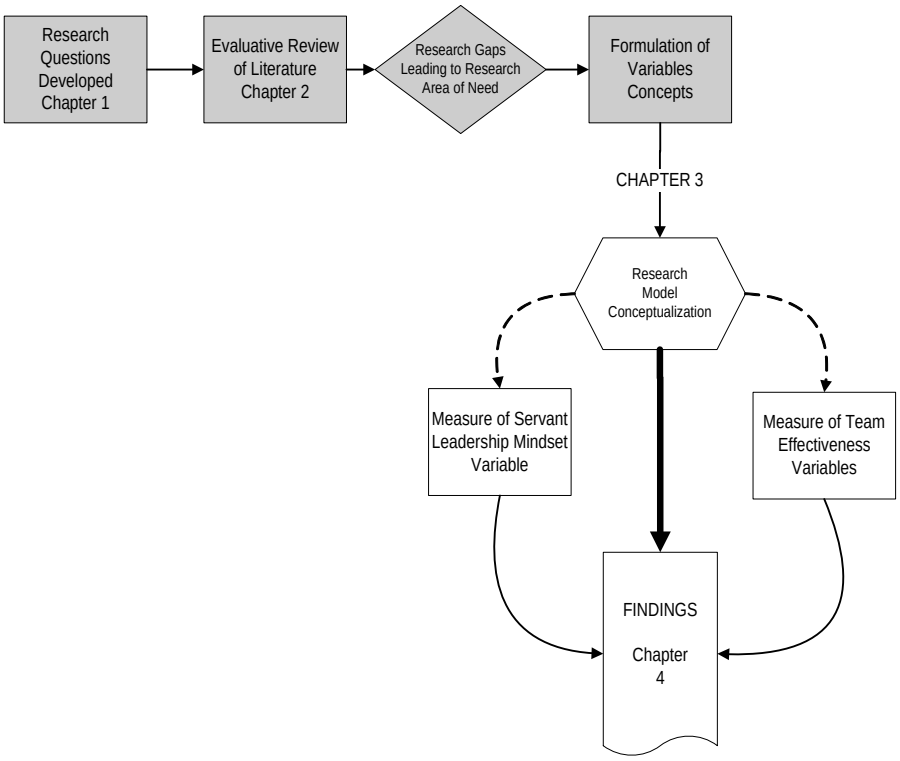



*Figure 3.1.* Chapter 3 Overview

The research question of this study was: To what extent are established manufacturing performance measurables correlated with the presence of servant leadership within the organization? Figure 3.2 provides a visual map of the research study.

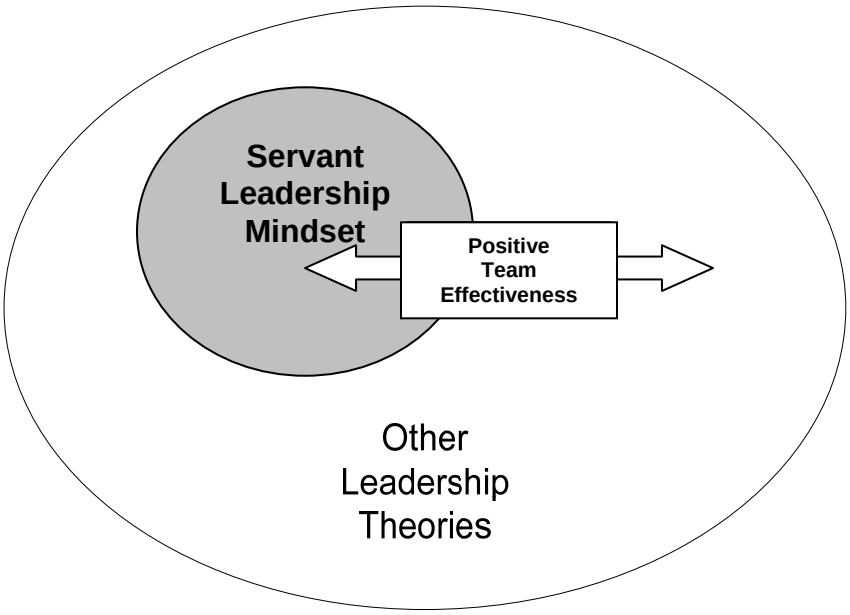



*Figure 3.2.* Visual Map of Research Study

A correlative method of comparison of the independent variable of servant leadership and the dependent variables of team effectiveness informed the researcher as the study was conducted and subsequent findings presented.

Independent Variable

*Servant Leadership*

The study's independent variable was the measure of servant leadership. Servant leadership is the independent variable because it represents the group classification against which the dependent variables were predicted to differ (Siegle, 2007). The study's determination of servant leadership within specific research groups was established by using the Organizational Leadership Assessment (OLA). The OLA instrument is a self-report survey created by Laub (1999) to facilitate identification of servant leadership within organizations for research purposes. Laub developed his instrument by surveying 14 servant leadership experts and using the results to produce a consensus on the

characteristics of the servant leader. He then developed his 60 key characteristics of the servant leader, and from this, he constructed an operational definition of servant leadership. Laub went on to field test the instrument with 828 participants from 41 organizations and achieved a reliability measure of .98 (Laub, 1999).

The instrument consists of statements, scored on a unidirectional, five-point Likert scale, ranging from strongly disagree (one) to strongly agree (five). The instrument uses six constructs or potential sub scores: (1) values people (respect and empathic listening), (2) develops people (modeling appropriate behaviors), (3) builds community (team / community building and allowing for individuality), (4) displays authenticity (honesty and integrity), (5) provides leadership (vision of the future), and (6) shares leadership (shared power and vision).

In a 2004 classroom lecture, Laub offered supplementary instructive commentary related to the subsets of his primary servant leadership components.

- *Valuing people*. Leaders approach others with an understanding that each person is valuable. This belief is based on trust and is not earned. Value to others is demonstrated through active listening and careful consideration of what is being shared.
- *Developing people.* Leaders understand the potential of others to grow as servants and leaders. This belief in potential may be without benefit of

current observations of organizational dynamics. Special attention is given to creating a learning environment.

- *Building Community*. This is consistent with the servant leadership value of building a group that values relationship over individual accomplishment of tasks. By working together and serving others, leaders model collaborative behaviors that build a partnership for team achievement.
- *Displaying Authenticity*. This sub-set features the leaders' understanding that they have a number of things to learn from followers. This openness leads to follower trust and increased involvement.
- *Providing Leadership.* The key is in the orientation of the leader. Leaders initiate action to serve the needs of the organization and team and not for personal aspiration. Leaders serve and set direction as they communicate with their followers.
- *Sharing Leadership*. Servant leadership recognizes the fact that leaders have positional authority and the power to make choices. An important distinction is that decision-making power is shared and followers are encouraged to act.

The selection of Laub's OLA instrument was based on the extensive use of the instrument in previous servant leadership research projects (Beazley, 2002; Drury, 2004; Herbst, 2003; Irving, 2005; Thompson, 2002). A further rationale is found in subsequent validation studies of the OLA instrument (Horsman 2003; Ledbetter, 2003). Table 3.1 compares the correlation analysis of both Laub's foundational study and Horsman's (2003) subsequent study.

Table 3.1

*Laub / Horsman Correlation Analysis* (Horsman, 2003, p. 100)

| | Laub | Horsman |
|---|---|---|
| Entire OLA Instrument | .9802 | .9870 |
| Six OLA Constructs | | |
| Values People | .91 | .92 |
| Develops People | .90 | .94 |
| Builds Community | .90 | .91 |
| Displays Authenticity | .93 | .95 |
| Provides Leadership | .91 | .92 |
| Shares Leadership | .93 | .95 |

## Dependent Variables

### *Team Effectiveness Measurements*

The dependent variables of team effectiveness selected for this study reflect the importance of the human elements within the manufacturing environment. The dependent variables of absenteeism, attrition, accident frequency, accident severity, and defective parts produced feature each element of the SMART goal model by being specific, measurable, acceptable, realistic, and timely goals. These dependent variables can be measured to determine the correlation with the independent variable of servant leadership.

The selection of the specific dependent variables for the study was not without precedent. Becker, Huselid, and Ulrich (2001) conducted survey research on organizational performance and used performance categories that included

attrition, product quality, and financial performance. Correlations between human resource measurements and financial performance were found. Other research efforts followed the Becker study and focused on discovering the connection between human resource measurements and the performance of businesses (Ulrich, 1997). Armstrong and Baron (2004) suggested that the process of delivering sustained success to organizations could be achieved by utilizing the capabilities of individuals and teams. Becker and Gerhart (1996) posited that human resources can create a business advantage that other firms cannot easily imitate. This supports the philosophical principle that people and not capital provide organizations with competitive advantage (Reynolds & Ablett, 1998).

## Dependent Variable Calculation

The North American Industry Classification System (NAICS) provides a standardized classification for all manufacturing facilities. The NAICS positions manufacturing facilities in a hierarchical system that corresponds with skill and training level and type of production. All work teams within this study fell into the machine tool (metal forming types) manufacturing NAICS code number 333513.

Team effectiveness measurements for each dependent variable were obtained for each facility from the human resource manager. These facility-specific measures were then compared to established manufacturing averages within the NAICS 333513 grouping.

### *Recordable Incident Rate Calculation Formula*

For this study, the dependent variable of recordable incident rate was measured in comparison to national safety averages as determined by the U.S.

Department of Labor. The work groups included in this study followed the basic OSHA requirement to calculate their recordable accident rates.

> You must consider an injury or illness to meet the general recording criteria, and therefore, to be recordable, if it results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. You must also consider a case to meet the general recording criteria if it involves a significant injury or illness diagnosed by a physician or other licensed healthcare professional, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness. (US.DOL.BLS, 2006b)

Incidence rates (IR) were calculated for numbers of injuries and/or illnesses for cases with days away and/or job transfer or restriction per 100 workers per year. The rate was calculated as:

$$IR = (N \times 200{,}000) \div EH$$

- N = Number of cases with days away and/or job transfer or restriction
- EH = Total hours worked by all employees during the calendar year
- 200,000 = Base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

The baseline measurement of the safety incident rate was determined by data compiled by the Bureau of Labor Statistics (BLS) for businesses within the

NAICS code number 333513. The baseline rate of recordable safety incidents is 6.6% (US.DOL.BLS, 2006c).

*Severity Rate Calculation Formula*

Severity rates (SR) are sometimes referred to as the days away, restricted, or transferred (DART). Measurements are calculated for number of days that injuries and/or illnesses, or for cases with days away and/or job transfer or restriction, per 100 workers per year. The rate is calculated as:

$$SR = N/EH \times 200{,}000$$

- N = Injuries and illnesses days away from work + injuries and illnesses days resulting in restricted work
- EH = Total hours worked by all employees during the calendar year
- 200,000 = Base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

The baseline for calculation of safety severity rate was determined by the OSHA averages for businesses within the NAICS code number 333513. The BLS records the NAICS 333513 industry average at 3.1 (US.DOL.BLS, 2006c). This provided the baseline measurement for the safety severity incident rate for all sample groups.

*Absenteeism Rate Calculation Formula*

The Bureau of Labor Statistics (US.DOL.BLS, 2006b) defines absenteeism as the ratio of workers with absences to total full-time wage earners. Absences were defined as instances when persons who usually work 35 or more hours per week worked less than 35 hours during the referenced week

for one of the following reasons: own illness, injury, or medical problems; childcare problems; other family or personal obligations; civic or military duty; and maternity or paternity leave.

On the U.S. Department of Labor's BLS Table 46, *Absences from Work of Employed Full-Time Wage and Salary Workers by Occupation and Industry,* data indicated that absenteeism within the manufacturing segment was tracking at a 3.1 percent rate (US.DOL.BLS, 2006a). This represented the base measurement for this study. The formula for calculation of absenteeism was:

AB = unexcused absences ÷ Scheduled Days

*Attrition Rate Calculation Formula*

Attrition (turnover) was defined as the number of total separations during the month divided by the number of employees who worked during or received pay for the pay period. Layoffs and job eliminations are not represented in attrition calculations. The U.S. Department of Labor calculation of manufacturing attrition in 2007 was set at 2.8% (US.DOL.BLS, 2006a). The calculation when establishing an individual sample site attrition rates was:

A = Terminations ÷ # in the workforce

*Defective Parts Produced Rate Calculation*

This study's measure of quality within manufacturing employed the Six Sigma goal of experiencing no more than 3.4 defective parts per one million parts produced. The intended purpose of Six Sigma was to increase profits by eliminating variability, defects, and waste. The process, pioneered by Bill Smith at Motorola in 1986, was designed to keep defect levels below 3.4 defects per

one million opportunities (Motorola, 2007). A part is considered defective if the physical part does not reach the measurement of fit or function.

Although, the team effectiveness measure for defective part production is based on the Six Sigma measure, this study did not measure the use or effectiveness of Six Sigma methodology within the research populations. The formula for calculation of defective part rate was:

Defective Part Rate = 1,000,000 ÷ Units x Defective Parts

## Research Question

The research question was: To what extent are established manufacturing performance measurables correlated with the presence of servant leadership within the organization?

## Hypotheses

The following five hypotheses were tested:

*Hypothesis 1*

- $H1^{o1}$: No significant relationship between employee absenteeism and servant leadership as measured by the OLA.
- $H1^{a1}$: Significant relationship between employee absenteeism and servant leadership as measured by the OLA.

*Hypothesis 2*

- $H2^{o2}$: No significant relationship between employee attrition and servant leadership as measured by the OLA.
- $H2^{a2}$: Significant relationship between employee attrition and servant leadership as measured by the OLA.

*Hypothesis 3*

- $H3^{o3}$: No significant relationship between employee accident rate and servant leadership as measured by the OLA.
- $H3^{a3}$: Significant relationship between employee accident rate and servant leadership as measured by the OLA.

*Hypothesis 4*

- $H4^{o4}$: No significant relationship between employee accident severity rate and servant leadership as measured by the OLA.
- $H4^{a4}$: Significant relationship between employee accident severity rate and servant leadership as measured by the OLA.

*Hypothesis 5*

- $H5^{o5}$: No significant relationship between defective parts produced and servant leadership as measured by the OLA.
- $H5^{a5}$: Significant relationship between defective parts produced and servant leadership as measured by the OLA.

Figure 3.3 provides a visual map of the five hypotheses tested in this study.

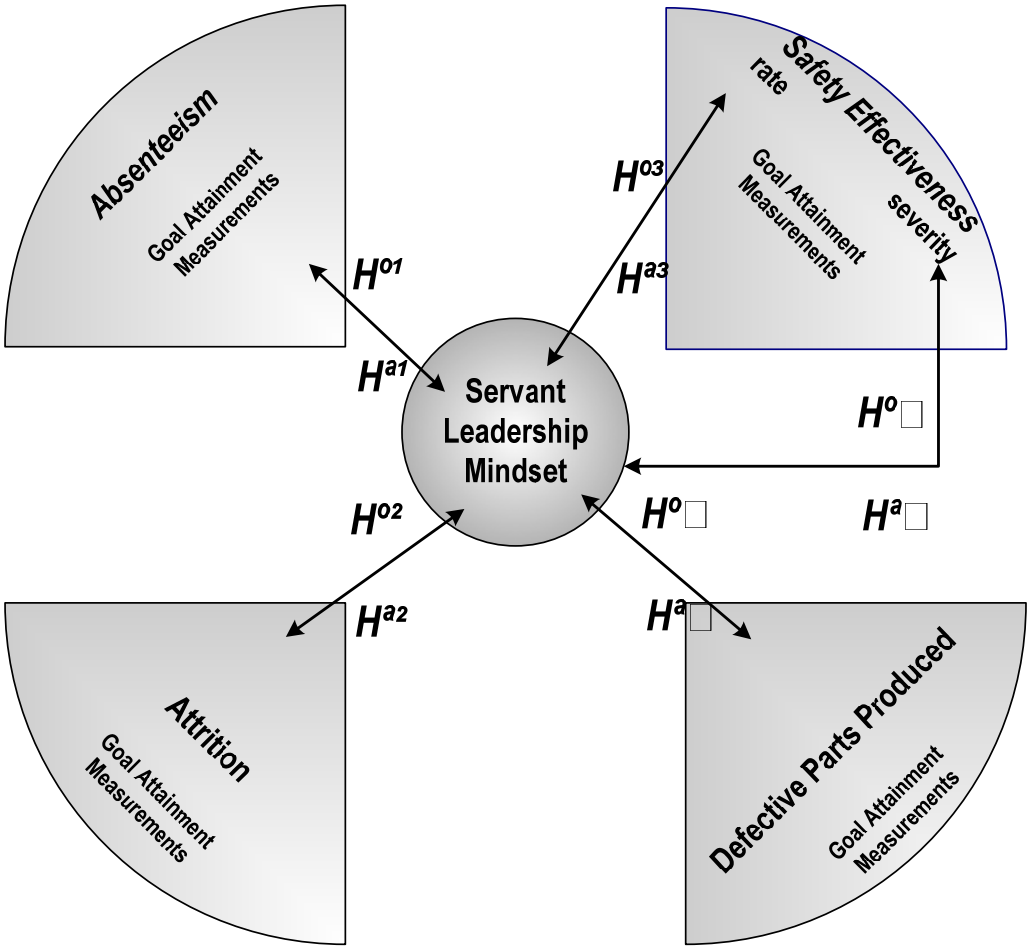



*Figure 3.3.* Hypothesis Model

Validity – Construct and External

*Construct Validity*

Evaluations of construct validity require the examination of the correlation between the measure being evaluated and variables that are known to be related to the construct measured (Stinchcombe, 1968). The primary variables in this study included servant leadership based on Greenleaf's (1977) original work on servant leadership as measured by the OLA instrument and team effectiveness measures in business and industry.

Construct validity related to the OLA instrument was established by past studies that demonstrated high levels of reliability (Horsman, 2003; Laub, 1999; Miears, 2004; Thompson, 2002). Laub (1999) observed that the OLA instrument had a reliability of .98 and indicated that “the reliability of the instrument indicates it will be useful for further research in servant leadership” (p. 87). From his study, Laub also reported the Cronbach-Alpha reliability coefficients of the six sub-scores were all .90 or above. Miears (2004) and Thompson (2002) likewise found equally high level of reliability in conducting research using the OLA in diverse settings.

All team effectiveness measures were represented within industry-wide guidelines, and each sample group made use of identically established formulas when reporting effectiveness measurements. Individual comparative evaluation of team effectiveness measurements were reached by comparing results with U.S. Department of Labor, U. S. Bureau of Labor Statistics, and Six Sigma established standards.

*External Validity*

External validity is related to generalizing and more specifically, the degree to which the conclusions in a study would hold for other persons in other places and at other times. The answer to the question of generalizability is not attainable mathematically.

The current study included populations from 28 organizations in the manufacturing domain and involved 4,557 employees. While the choice of a single business and industry segment (automotive) for all population samples

appears to limit the ability to generalize the findings of this study, the individual autonomy of each plant's culture produced some limited measure of external validity. Participants were representative of typical employees in manufacturing settings within business and industry and included all hourly, salaried, and clerical staff members at each location. Each respondent was asked to extend responses related to his or her immediate supervisor or manager.

The relative proximity of study samples also affected the external validity. All groups were situated within the Midwestern U.S. The study was conducted in the months of April and May 2007. The results represented a specific point in time and cannot be generalized over other time periods. Replication of the results of this study through repetitive examination would bolster the generalizability of the initial findings.

## Correlative Method of Inquiry

The measurement method selected for this project was the Spearman's rank correlation coefficient. Even though the variables in the study were ratio level, Pearson's (parametric) correlation was not appropriate. The Spearman correlation coefficient measurement is a non-parametric measure of correlation and allows for an arbitrary monotonic function that describes the relationship between two variables. This measurement does not assume a linear relationship between variables and can be used for variables measured at the ordinal level. This study provided ratio levels in the findings. The Cohen correlation coefficients measurement guidelines were used for interpretation of a correlation coefficient relationship (Table 3.2).

Table 3.2.

*Cohen Correlation Coefficients Measurement Guidelines* (Cohen, 1988)

| Correlation | Negative | Positive |
|---|---|---|
| Small | -0.29 to - 0.10 | 0.10 to 0.29 |
| Medium | -0.49 to - 0.30 | 0.30 to 0.49 |
| Large | -0.50 to - 1.00 | 0.50 to 1.00 |

## Population and Sampling Groups

Strict rules for defining the target population for research projects do not exist, thus the researcher's logic and judgment must be relied upon. The population for this study was defined by adhering to the primary objective of the inquiry: to examine servant leadership within the manufacturing environment. The 28 manufacturing worksites featured in this research project represented 4,557 employees who produce over 500 million dollars in annual sales. The context of this study is contained within the Midwestern section of the U.S.

All research groups share the same customer base and are direct tier-one parts suppliers to automotive manufacturers. These shared traits effectively removed some potential differences that could be problematic when conducting multi-site research. The specific population was selected in part due to the industry-wide uniformity and standardization of effectiveness goal measurements. Calculation formulas for each effectiveness measure result from a shared methodology.

Organization and Clarity of Research Design

*Servant Leadership*

The collection of the OLA responses followed the common research goal of collecting data that is representative of a population. Permission to administer the OLA instrument was obtained from the Vice-President of human resources of the selected corporation (Appendix C). Figure 3.4 provides an overview of the data collection process that was used in the study.

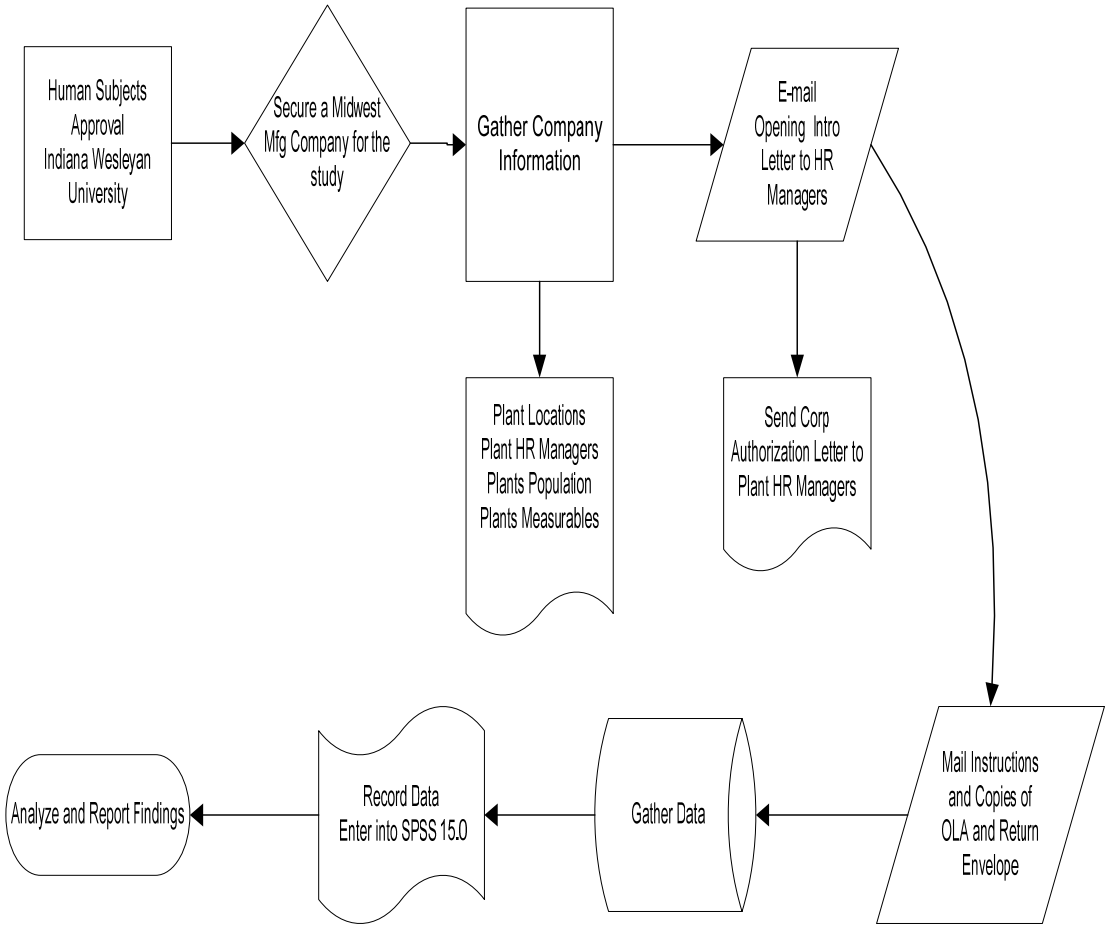



*Figure 3.4.* Data Collection Model

Permission to use the OLA was granted, and copies of the instrument were mailed to the human resource managers at each research location. A letter

was read to all respondents (Appendix B), and employees received verbal assurance that individual responses would not be identifiable. Further communication assured respondents that individual scores would be tabulated as an aggregate value and participation was strictly voluntary.

Research groups were unaware that they were assigned a unique code (this code was written on the inside of the return envelope), and their responses were placed in pre-paid self addressed envelopes and mailed by the human resource manager of each individual site. All returned OLA surveys were reviewed to eliminate invalid responses, such as questionnaires with unanswered questions or with identical responses to every question. The data was then gathered, totaled, and entered into the SPSS 15.0.

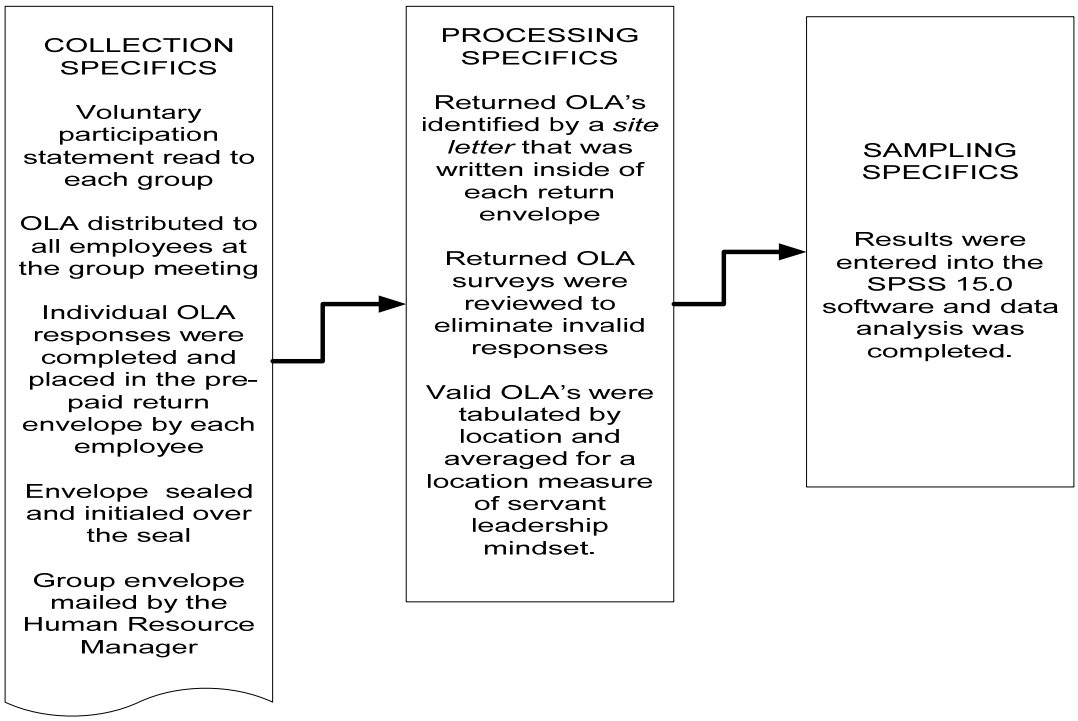



*Figure 3.5*. Visual Map of OLA Sampling Method

*Team Effectiveness Components*

The team effectiveness measurements for all Balanced Scorecard (BSC) / Key Performance Indicator (KPI) items were obtained for each facility from the human resource manager. Chapter 2 highlighted the extensive use of BSC / KPI methods within manufacturing, and this study acknowledged this and chose to produce findings in a format that business and industry leaders would recognize. The following data relevant to team effectiveness (dependent variables) were collected at 28 individual manufacturing plants: (1) attrition rates (both exempt and non-exempt personnel), (2) absenteeism rates (both exempt and non-exempt hourly employees as compared to the Bureau of Labor Standards), (3) and (4) safety data (OSHA frequency and severity rates as compared to the Department of Labor guidelines), and (5) defective parts produced rates (a quality measurement of defective parts produced per million). Figure 3.6 provides a visual map of the team effectiveness measurements.

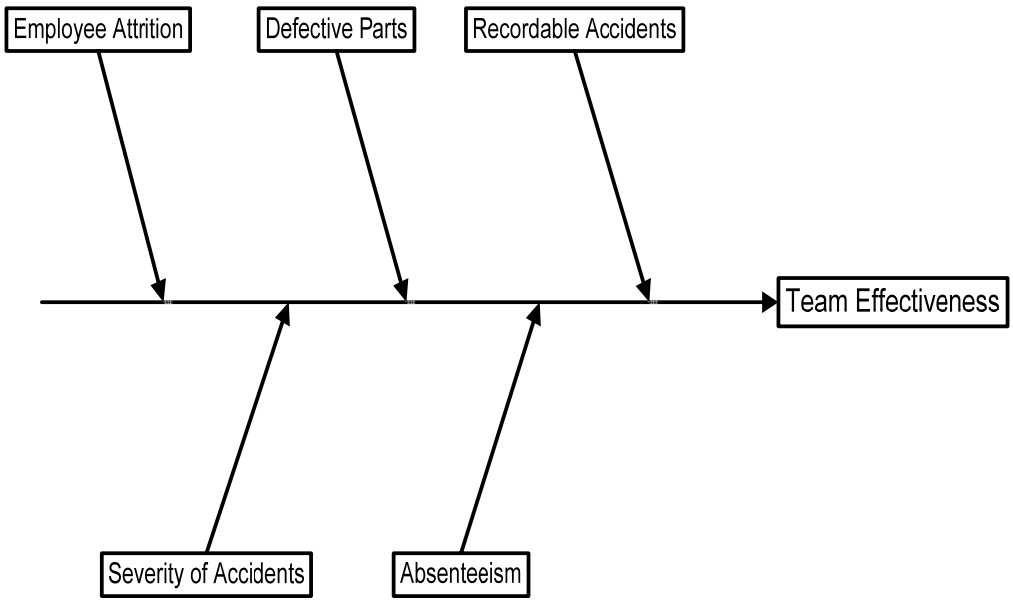



*Figure 3.6.* Visual Map of Effectiveness Components

While the study examined traditional empirical data measurables within the manufacturing environment, this approach is not without its critics. The drive for quantitative representation of organizational effectiveness is criticized by a number of researchers (Boylke, 2000; Caulkin, 2001). Watkins (2006) argued that today's managers and culture have an ongoing fixation with performance and performance indicators. He contended that targets are simplistic measures that become the focus of attention and efforts.

## Summary

Theories and models of leadership have been developed, researched, replicated, and eventually expanded over the years. Team effectiveness also shares a strong tradition of inquiry. Finding correlative leadership features that tend to advance team effectiveness is a fundamental area of interest within leadership research.

Very little has been undertaken in the investigation of the effect of servant leadership on team effectiveness in the for-profit sector (Ostrem, 2006). In particular, the manufacturing environment has garnered minimal interest from researchers of servant leadership. Past research tended to point to correlative relationships between servant leadership and team effectiveness in the NFP sectors of business (Herbst, 2003; Irving, 2005). However, do the servant leadership mindsets of valuing people, developing people, building community, displaying authenticity, providing leadership, and sharing leadership correlate with effective teams within the industrial manufacturing environment?

Chapter 3 illustrated the methods used in conducting this dissertation project. Employees who work in the manufacturing environment were identified as the population of the study and mail survey data collection in the form of the OLA instrument was detailed. This chapter went on to reveal the research question and hypotheses, established the validity of the proposed study and the identified the use of SPSS software for data processing. The following chapters will present an analysis of the study's findings and provide interpretation of and recommendations based on the results.

# CHAPTER 4

# ANALYSIS AND PRESENTATION OF FINDINGS

Chapter 4 reports the research findings resulting from the data collection and analysis methods defined in Chapter 3. The research study was designed to answer the research question: To what extent are established manufacturing performance measurables correlated with the presence of servant leadership within the organization? Five hypotheses were tested to determine correlative relationships between the independent variable of servant leadership and team effectiveness dependent variables. This chapter reviews the data collection process and response rates, and presents graphic displays and descriptive statistics for each variable. The chapter concludes with a summary of the research findings.

## Population

A Midwest-based automotive parts manufacturing organization agreed to participate in the study, allowing the anonymous representation of their company, all individual sites, and the participants. Twenty-eight individual manufacturing facilities participated. A total of 4557 subjects were enlisted for the study, and 4052 OLAs were completed and returned. The participation from the 28 sample sites produced a high percentage of completed OLA's (Table 4.1).

Table 4.1.

*Individual Sample Population Data*

| Location | Population | Sample "N" | % |
|---|---|---|---|
| A | 215 | 199 | 92.5 |
| B | 175 | 162 | 92.6 |
| C | 125 | 111 | 88.8 |
| D | 255 | 218 | 85.4 |
| E | 111 | 88 | 79.3 |
| F | 162 | 129 | 79.6 |
| G | 115 | 101 | 87.8 |
| I | 199 | 188 | 94.5 |
| J | 215 | 190 | 88.4 |
| K | 188 | 178 | 94.7 |
| L | 135 | 115 | 85.2 |
| M | 201 | 182 | 90.5 |
| N | 195 | 181 | 92.8 |
| O | 214 | 201 | 93.9 |
| P | 102 | 99 | 97.1 |
| Q | 218 | 204 | 93.6 |
| R | 177 | 149 | 84.2 |
| S | 165 | 139 | 84.2 |
| T | 115 | 104 | 90.4 |
| U | 156 | 122 | 78.2 |
| V | 115 | 105 | 91.3 |
| W | 175 | 166 | 94.9 |
| X | 189 | 175 | 92.6 |
| Y | 155 | 128 | 82.6 |
| Z | 187 | 147 | 78.6 |
| AA | 180 | 170 | 94.4 |
| AB | 118 | 101 | 95.6 |
| TOTALS: | 4557 | 4052 | 88.9% |

The number of completed surveys returned represented an 88.9% response rate. This response rate implies that data from the sample of participants can be considered representative of the larger group. The high

response rate is consistent with the researcher's expectations when the sample group was selected. Collection of the OLA responses coincided with mandatory monthly communication meetings in which employees are often asked to complete written training, surveys, and questionnaires. The voluntary nature of the request was communicated when the consent form was read, and participants followed past practice, completing the survey as part of their monthly communication meeting agenda. Union representatives at several facilities expressed traceability and retaliatory concerns related to the data gathered for this study. In response to these concerns, no respondent demographic information was gathered. This eliminated potential investigative information such as the age of the workforce, work experience level, and educational backgrounds.

## Data Collection Process

The data collection approval was obtained via a form signed by the Executive Vice-President of human resources at the researched organization that provided consent to participate in the study (Appendix C). The OLA instrument was distributed to all employees (salaried and hourly) at the previously described group meetings. At each site, the human resource managers read the informed consent form (Appendix B) before the employees completed the OLA instrument. The informed consent form contained assurances that the researcher would maintain the confidentiality of each participant's personal information and that the information would only be available to the researcher. Assurances also guaranteed that descriptive characteristics that could identify individual sites

would not be included in the findings. Each employee completed an individual OLA response which was then placed in a pre-paid return envelope. The envelopes were sealed, initialed over the seal, and forwarded to the researcher by pre-paid return postage.

Each respondent's OLA questionnaire was reviewed and the following criteria were used to exclude a response from the study or to add a value for missing data.

1) If an individual response gave the exact same response for all questions on the OLA instrument, that sample was excluded. The researcher viewed this as unresponsive and the resulting effect could skew the overall sample data. A total of 114 responses were excluded from the study because all but two of the 66 responses were rated with the same value.
2) A non-response for an individual question was interpreted as a subject who believed that the statement did not apply to him or her. An OLA value of "undecided" (3) was entered for such responses. The practice did not adversely affect the final results of an OLA score in any significant way.
3) Three or more non-responses on any individual sample resulted in that sample being excluded from the study. Forty-two such samples were removed from consideration.

The exclusion criteria of the study reduced the "n" value from 4052 to a final total of 3896.

## Exploratory Data Analysis

The Spearman rank correlation was used to determine the direction and significance of the association between the independent variable of servant leadership and each of the five dependent variables of team effectiveness. The SPSS 15.0 software was used for correlative computations, descriptive statistics, and all analyses for hypothesis tests.

### *OLA Baseline Measurements*

The study began with visual and descriptive exploration of the data that was collected. To achieve the purposes of the research study, one standardized instrument (the OLA) was used in determining the presence of servant leadership at each of the 28 locations surveyed. The baseline scores for each location's level of servant leadership were determined by using Table 4.2.

Table 4.2

*Laub's Score Sheet for Baseline Scores for the OLA*

| Raw Score | Organizational Description |
|---|---|
| 0.0 to 1.999 | Organization 1 - Toxic Organizational Health |
| 2.0 to 2.999 | Organization 2 - Poor Organizational Health |
| 3.0 to 3.499 | Organization 3 - Limited Organizational Health |
| 3.5 to 3.999 | Organization 4 - Moderate Organizational Health |
| 4.0 to 4.499 | Organization 5 - Excellent Organizational Health |
| 4.5 to 5.0 | Organization 6 - Optimal Organizational Health |

Laub's original findings were replicated in the Ledbetter study (2003). In the original study, the lowest item-to-item correlation was .41 and the highest was .77. Ledbetter's findings resulted in item-to-item correlations ranging from .44 to .78. These independent item analysis findings indicate a strong correlation with the instrument. Ledbetter continued his replication of the earlier Laub study as he conducted a test-retest study. The correlation between the test and retest proved to be significant, and the findings indicated that the reliability of the OLA remained consistent over time. Both the test and retest were significant at $p<.01$.

Figure 4.1 depicts the data points for the mean OLA rating for each of the 28 locations included in the current research study.

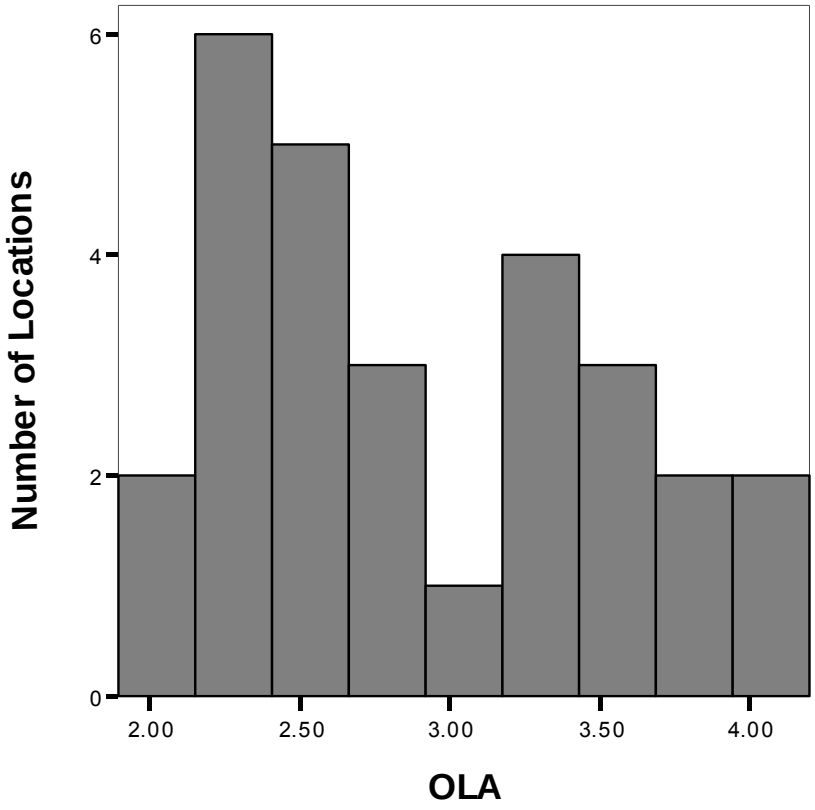



*Figure 4.1.* Histogram of Servant Leadership Levels (OLA)

The overall OLA measurement average was 2.94. This placed the combined average for the 28 plants at an “organization two” on the OLA rating scale. The 28 sites’ average on the OLA scale positions the organization as one that exhibits “poor organizational health” with regard to servant leadership. Although at the upper end of the “organization two” scale, the 2.94 score places this organization at the lower end of the Likert scale (1-5) of servant leadership measures. Thirteen of the 28 sites fell within the range of 2.25 and 2.75 as represented by the main peak of the histogram in Figure 4.1. A smaller grouping of locations was in the 3.2 to 3.7 range.

*Team Effectiveness Measurements*

The team effectiveness measures for each facility were provided by the plant’s human resource manager. These measurements were common to each facility and reflect the same formula for calculation and are standard measures within business and industry. The totals represent an average of the first four months of 2007.

*Absenteeism*

The Bureau of Labor Statistics defines absenteeism as the ratio of workers with absences to total full-time wage and salary employment. Absences are defined as instances when persons who usually work 35 or more hours per week worked less than 35 hours during the reference week for one of the following reasons: own illness, injury, or medical problems; childcare problems; other family or personal obligations; civic or military duty; and maternity or paternity leave.

Figures 4.2 and 4.3 highlight the data that represent the individual absenteeism rates for all research sites.

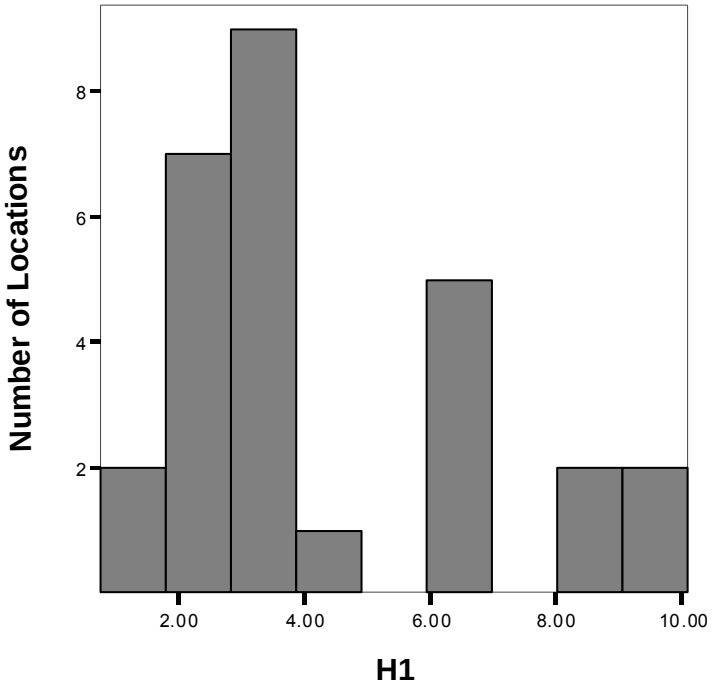
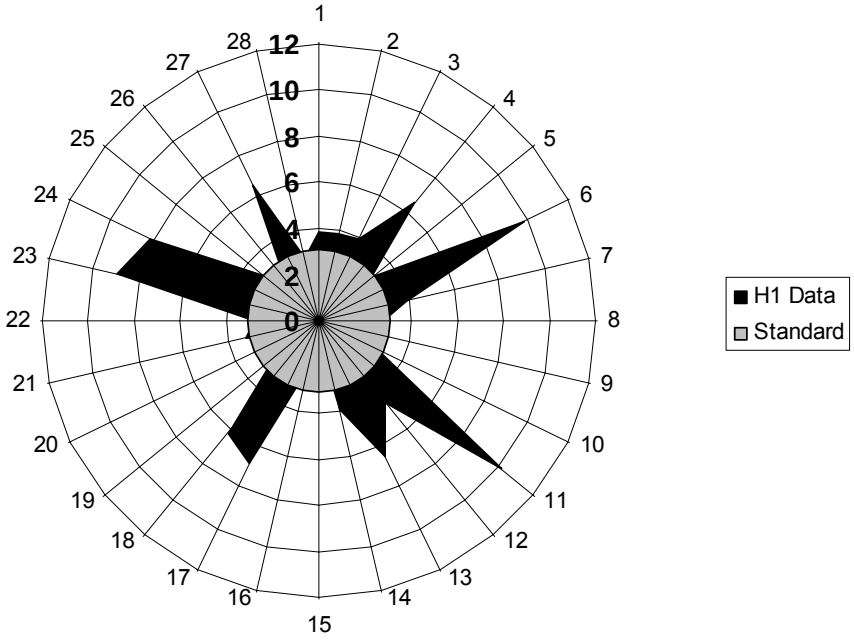



*Figure 4.2.* Histogram of Absenteeism Rates (H1)




Note: Established Industry Average for Absenteeism Rate = 3.10

*Figure 4.3.* Radar Graph of Absenteeism Rates (H1) versus Industry Averages

The histogram demonstrated a cluster of data points in the 2.0% - 4.0% range. The overall appearance was a left-skewed distribution. Several groups of distant data points created a somewhat bimodal appearance. Figure 4.3 revealed that 14 of the 28 data points (50.0%) were beyond of the established industry-wide average of absenteeism (H1).

A scatterplot (Figure 4.4) was created to offer a visual display of the relationship between absenteeism and the OLA for the 28 locations surveyed. There appears to be a moderately strong negative correlation between the OLA and H1. That is, as the servant leadership increases, absenteeism rates generally decline. For example, locations with an OLA of 2.5 had absenteeism rates of 3% to 10%, while locations with an OLA of 4 had absenteeism rates of only 2% to 4%.

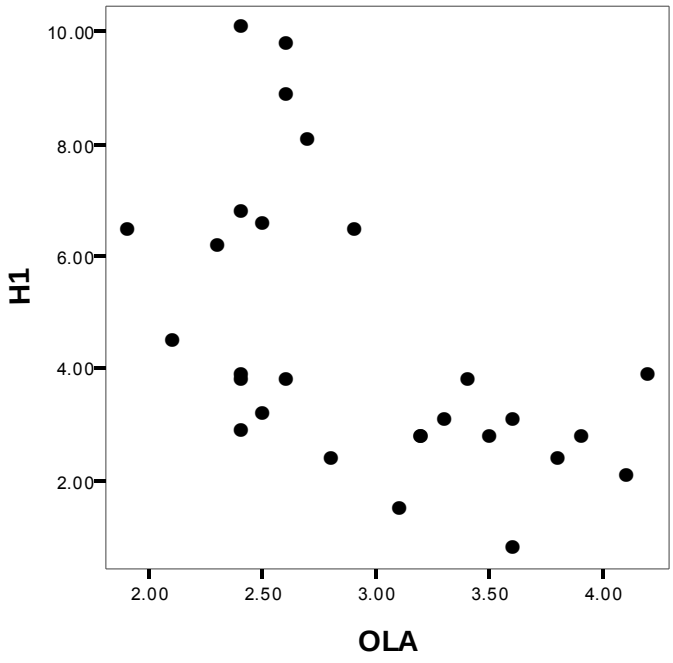



*Figure 4.4.* Scatterplot of Absenteeism Rates (H1) versus OLA

*Attrition*

Attrition rate (H2) is defined as the number of total separations during the period of measure divided by the average number of employees who worked or received pay during the same period.

Figures 4.5 and 4.6 represent the attrition rate for the research sites.

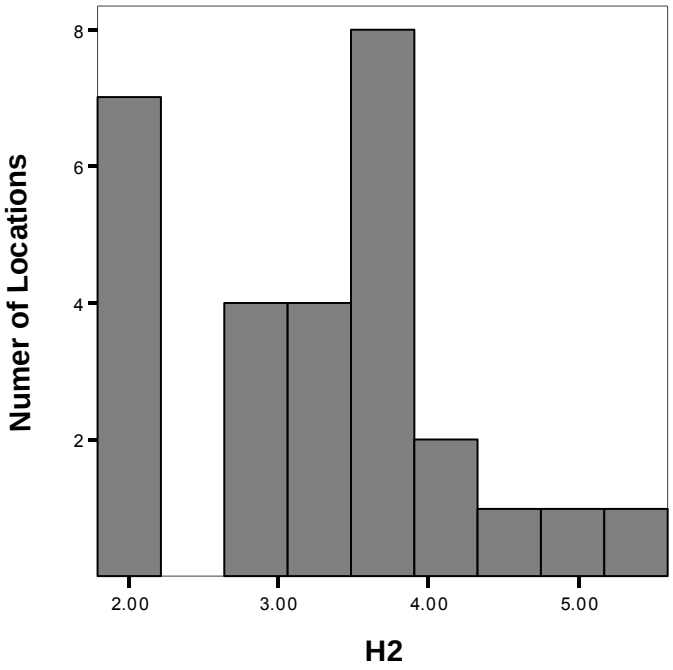
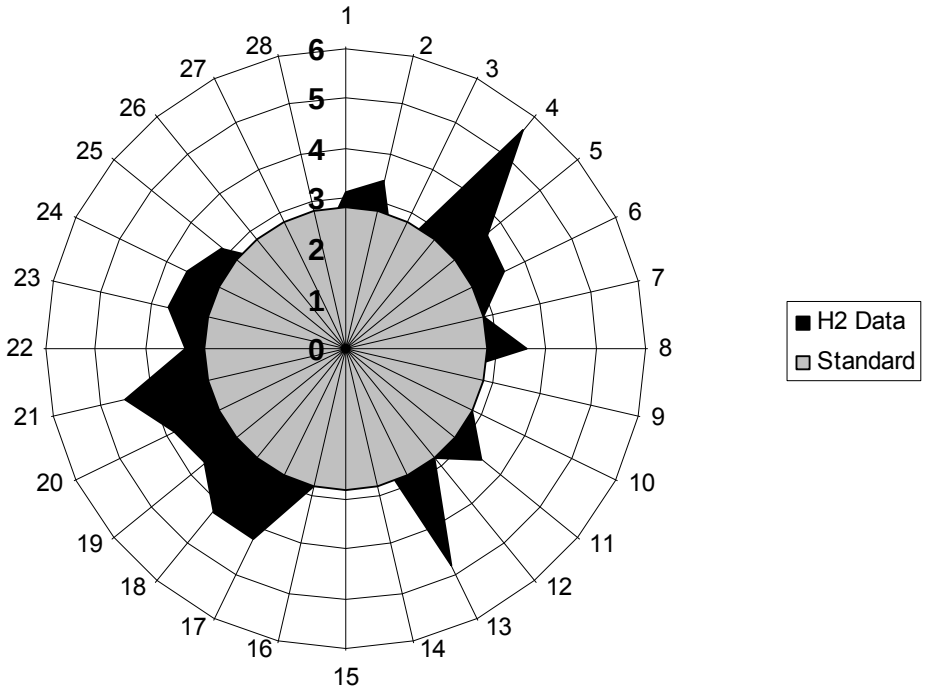



*Figure 4.5.* Histogram of Attrition Rates (H2)




Note: Established Industry Average for Attrition Rate = 2.80

*Figure 4.6.* Radar Graph of Attrition Rates (H2) versus Industry Averages

The histogram demonstrated a bimodal distribution main cluster of data points in the 3.0% - 4.0% range and a smaller group from roughly 1.6% to 2.3%, representing the second largest individual grouping of data points. While this attrition rate appears quite high, given it occurs at locations with low OLA scores, it is not overly surprising. Figure 4.6 indicated that 17 of the 28 attrition measurements (60.7%) were outside of the established industry averages for attrition (H2).

A scatterplot (Figure 4.7) was created to offer a visual display of the relationship between the OLA and the attrition rate for the 28 locations surveyed. It appears that as servant leadership increases, the attrition rates generally exhibit a decline. Seven locations with a strong OLA measure between 3.5 and 4.4 had attrition rates below the industry average. In contrast, 7 of 10 sites that

experienced a poor OLA measurement (between 1.5 and 2.5) exhibited attrition rates above the manufacturing industry averages.

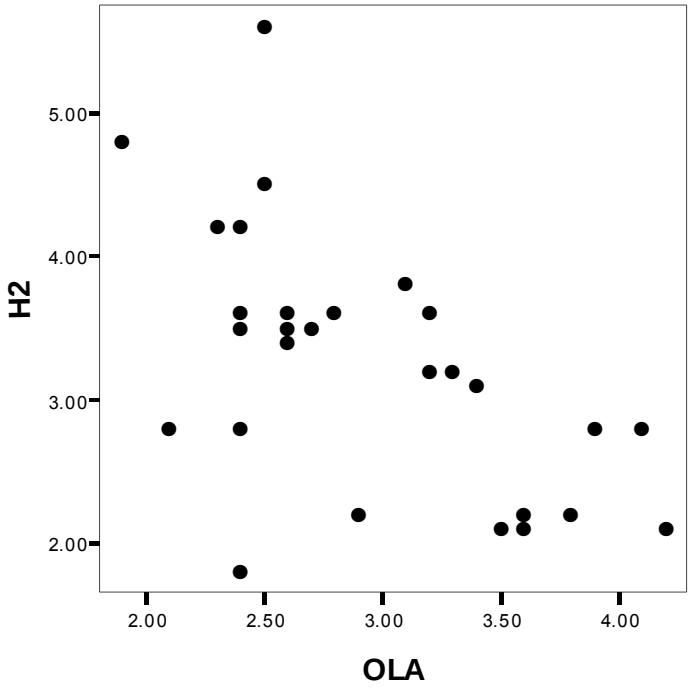



*Figure 4.7.* Scatterplot of Attrition Rates (H2) versus OLA

The attrition measurements in the preceding figure tended to indicate a moderately strong negative correlation between the OLA and the H2 dependent variable of attrition.

*Recordable Accident Rate*

All work groups calculated safety measurements within the basic OSHA (Occupational Safety and Health Administration) guidelines. Figures 4.8 and 4.9 highlight the data representing recordable accident rates for all research sites.

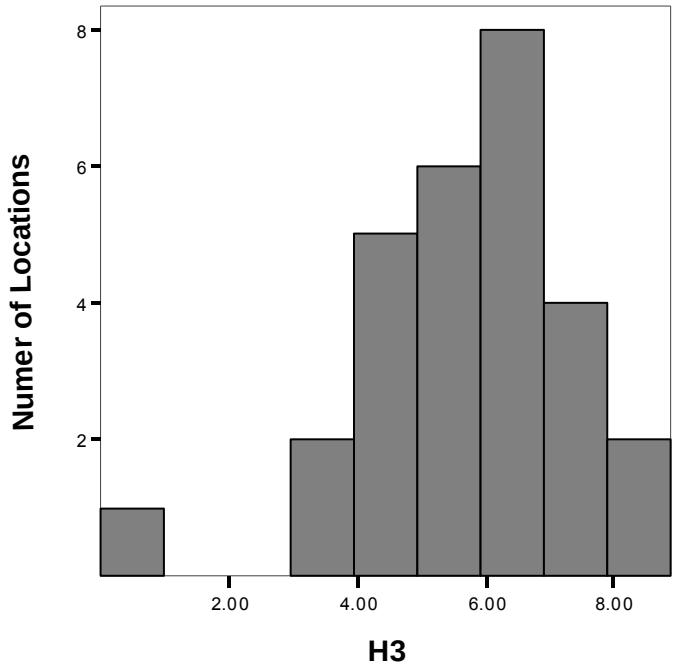
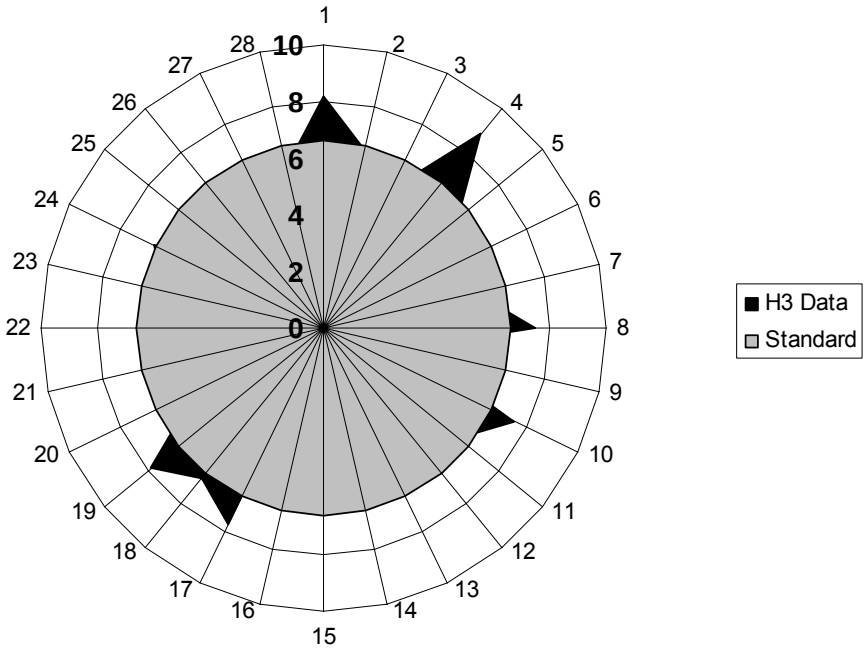



*Figure 4.8.* Histogram of Recordable Accident Rates (H3)




Note: Established Industry Average for Recordable Accident Rate = 6.60

*Figure 4.9.* Radar Graph of Recordable Accident Rates (H3) versus Industry Averages

The histogram demonstrated a roughly bell-shaped curve centered on the cluster of data points in the 4.7% - 7.0% range. An outlier of 0.0% was identified. Figure 4.9 indicated that 6 of the 28 recordable accident rates (21.4%) were outside of the established industry standards.

A scatterplot (Figure 4.10) was created to offer an additional visual display of the relationship between the OLA and the recordable accident rate (H3). The scatterplot of accident rates falls roughly in a horizontal band indicating that the recordable accident rate at the research sites does not vary strongly with changes in servant leadership.

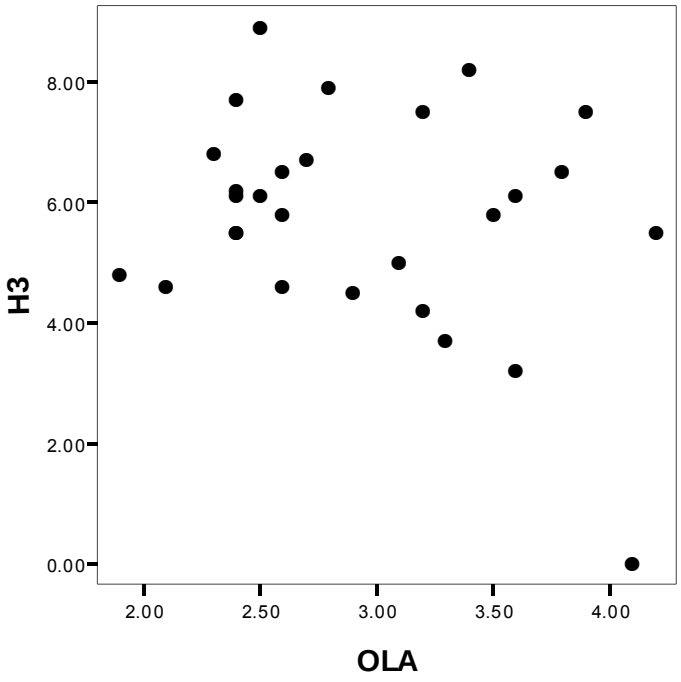



*Figure 4.10.* Scatterplot of Recordable Accident Rates (H3) versus OLA

The attrition measurements indicated by the preceding figures reveal a very weak negative correlation between the OLA and the H3 dependent variable of recordable accident rate.

*Accident Severity Rate*

Figures 4.11 and 4.12 highlight the data points that represent the individual accident severity rate for all research sites.

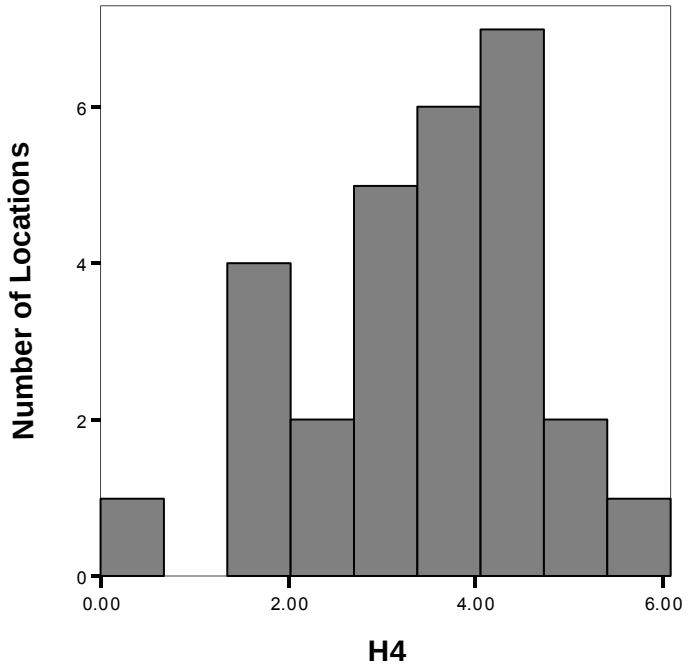
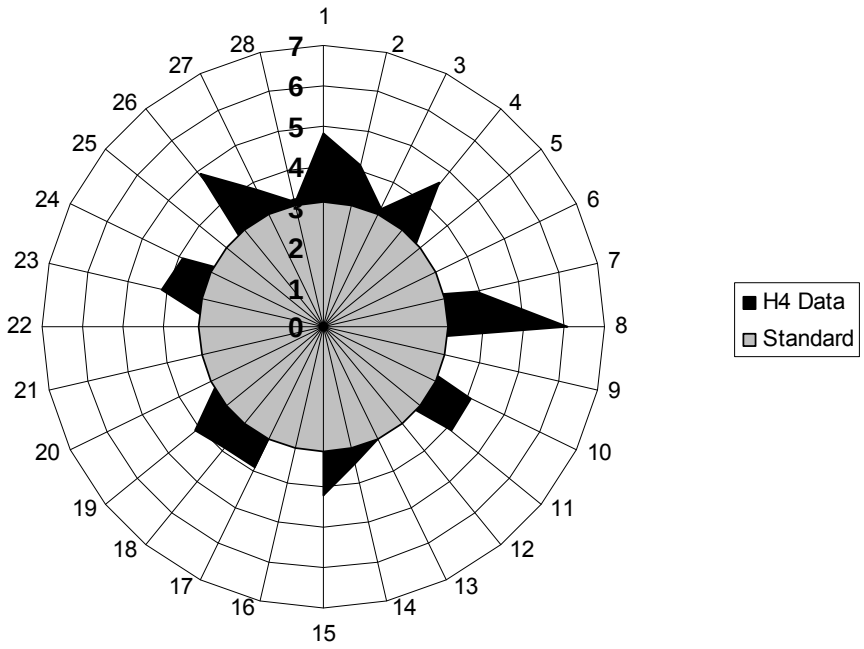



*Figure 4.11.* Histogram of Accident Severity Rates (H4)




Note: Established Industry Average for Accident Severity Rate = 3.10

*Figure 4.12.* Radar Graph of Accident Severity Rates (H4) versus Industry Averages

The histogram shows a main cluster of data points in the 2.7% - 4.7% range and a right-skewed tail. An outlier of 0.0% was identified, corresponding to the location that experienced no accidents. Figure 4.12 revealed that 18 of the 28 data points (64.3%) were outside of the established industry averages of recordable accident rate (H4).

A scatterplot (Figure 4.13) was created to depict the relationship between the OLA and the recordable accident rate in the research sample. Recordable accident rates populated all quadrants of the scatterplot showing no clear relationship between the variables. Therefore, no relationship between OLA and corresponding recordable accident rated could be observed.

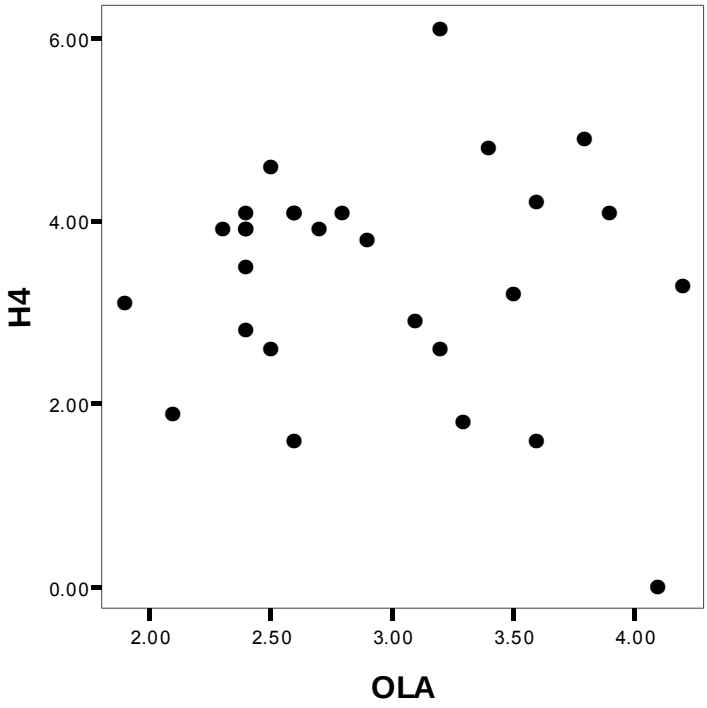



*Figure 4.13.* Scatterplot of Accident Severity Rates versus OLA

*Defective Parts Produced Rate*

Figures 4.14 and 4.15 highlight the data points that represent the individual defective parts produced rate for all research sites.

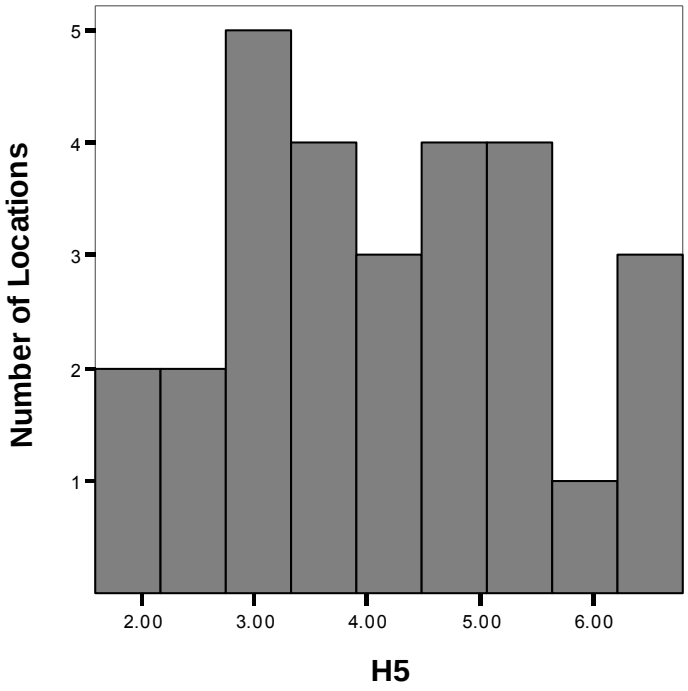
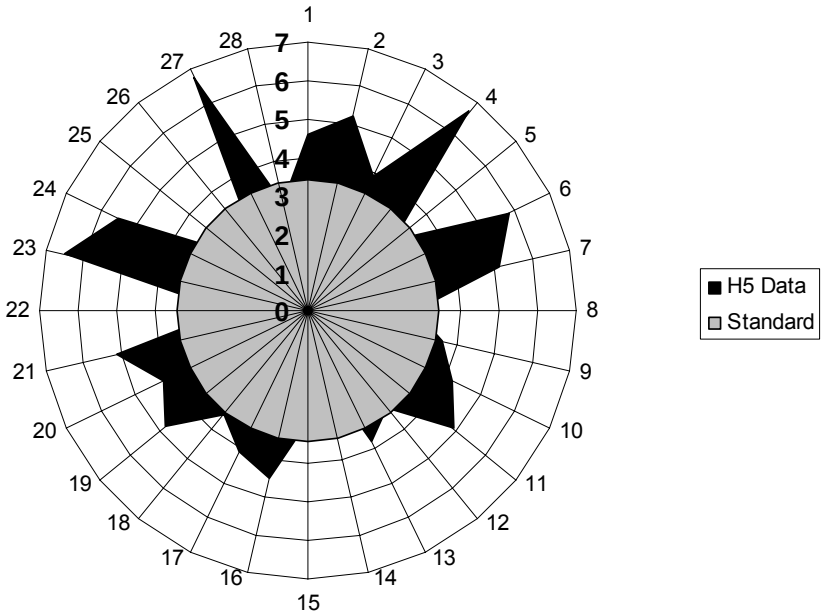



*Figure 4.14.* Histogram of Defective Parts Produced Rates (H5)




Note: Established Industry Average for Defective Parts Rate = 3.40

*Figure 4.15.* Radar Graph of Defective Parts Produced Rates (H5) versus Industry Average

The histogram demonstrated a rather flat or uniform distribution of defective parts produced measurements. Figure 4.15 revealed that 17 of the 28 data points (60.7%) were outside of the established industry standards of defective parts produced rates (H5).

A scatterplot (Figure 4.16) was produced to illustrate the relationship between the OLA and the defective parts produced rates for the research sample. The defective parts produced rates offered no clear pattern. The nine defective parts produced rates below an OLA value of 2.5 demonstrated better defective parts produced rates (lower number) than the seven research sites in the 2.5 - 3.0 range, indicating a *slight* negative relationship.

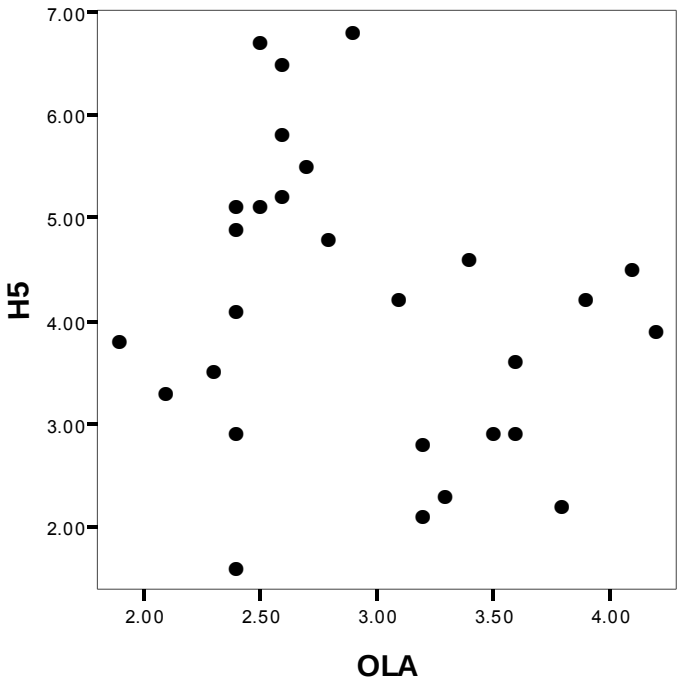



*Figure 4.16.* Scatterplot of Defective Part Rates (H5) versus OLA

Similar to H3, the defective parts produced rates indicated a very weak negative correlation with the OLA.

## Testing of Hypotheses

Table 4.3 summarizes Spearman's correlation for each performance measure (H1 through H5) versus the OLA. The top row provides each of the correlation coefficients. The second row, Sig. (2-tailed), provides the p value for each of the five hypothesis tests.

Table 4.3

*Spearman Rank Correlation for H1-H5 versus OLA*

| | | | OLA | H1 | H2 | H3 | H4 | H5 |
|---|---|---|---|---|---|---|---|---|
| Spearman's Rank | OLA | Correlation Coefficient | 1.000 | **-.599** | **-.547** | **-.119** | **.056** | **-.165** |
| | | Sig. (2-tailed) | 0.00 | **.001** | **.003** | **.547** | **.777** | **.403** |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |
| | H1 | Correlation Coefficient | -.599 | 1.000 | .285 | .085 | .015 | .508 |
| | | Sig. (2-tailed) | .001 | . | .142 | .668 | .938 | .006 |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |
| | H2 | Correlation Coefficient | -.547 | .285 | 1.000 | .399 | .115 | .330 |
| | | Sig. (2-tailed) | .003 | .142 | . | .036 | .560 | .086 |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |
| | H3 | Correlation Coefficient | -.119 | .085 | .399 | 1.000 | .813 | .182 |
| | | Sig. (2-tailed) | .547 | .668 | .036 | . | .000 | .355 |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |
| | H4 | Correlation Coefficient | .056 | .015 | .115 | .813 | 1.000 | .132 |
| | | Sig. (2-tailed) | .777 | .938 | .560 | .000 | . | .504 |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |
| | H5 | Correlation Coefficient | -.165 | .508 | .330 | .182 | .132 | 1.000 |
| | | Sig. (2-tailed) | .403 | .006 | .086 | .355 | .504 | . |
| | | N | 28 | 28 | 28 | 28 | 28 | 28 |

A p-value below .05 will be deemed statistically significant. That is, the pattern observed in the scatterplot is highly unlikely (probability less than 5%) to appear just by chance. The following sub sections will review the individual H1-H5 results.

*Absenteeism (H1)*

The H1 null hypothesis was: no significant relationship between employee absenteeism and servant leadership as measured by the OLA. Table 4.4 confirms a moderately strong negative association between the OLA and H1 with a Spearman's rank correlation of -.599. The p value of .001 provides strong evidence for the alternate hypothesis: a relationship between servant leadership and the plant's absenteeism rate.

Table 4.4

*Spearman's Rho 2-Tailed Correlation Coefficient for H1*

| | | | **OLA** | **H1** |
|---|---|---|---|---|
| Spearman's rho | **OLA** | Correlation Coefficient | 1.000 | **-.599(**)** |
| | | Sig. (2-tailed) | . | **.001** |
| | | N | 28 | 28 |
| | **H1** | Correlation Coefficient | -.599(**) | 1.000 |
| | | Sig. (2-tailed) | .001 | . |
| | | N | 28 | 28 |

** Correlation is significant at the 0.01 level (2-tailed).

*Attrition (H2)*

The H2 null hypothesis was: no significant relationship between employee attrition and servant leadership as measured by the OLA. Table 4.5 confirms the association between the OLA and H2.

Table 4.5

*Spearman's Rho 2-Tailed Correlation Coefficient for H2*

| | | | OLA | H2 |
|---|---|---|---|---|
| Spearman's rho | **OLA** | Correlation Coefficient | 1.000 | **-.547(**)** |
| | | Sig. (2-tailed) | . | **.003** |
| | | N | 28 | 28 |
| | **H2** | Correlation Coefficient | -.547(**) | 1.000 |
| | | Sig. (2-tailed) | .003 | . |
| | | N | 28 | 28 |

** Correlation is significant at the 0.01 level (2-tailed).

Spearman's rank correlation of -.547 indicates a moderately strong negative correlation, and the p value of .003 is significant with regard to the attrition hypothesis. Thus, statistical evidence of a relationship between servant leadership and attrition rates was established. The evidence relating servant leadership to both H1 and H2 was extremely strong, being significant not only at the .05 level but also at the .01 level. The alternative H2 hypothesis is supported within this sample population.

*Recordable Accident Rate (H3)*

The H3 null hypothesis was: no significant relationship between recordable accident rates and servant leadership as measured by the OLA. The

Spearman's rank correlation table was created to further examine the correlation coefficient, and the results are offered in Table 4.6.

Table 4.6

*Spearman's Rho 2-Tailed Correlation Coefficient for H3*

| | | | OLA | H3 |
|---|---|---|---|---|
| Spearman's rho | **OLA** | Correlation Coefficient | 1.000 | **-.119** |
| | | Sig. (2-tailed) | . | **.547** |
| | | N | 28 | 28 |
| | **H3** | Correlation Coefficient | -.119 | 1.000 |
| | | Sig. (2-tailed) | .547 | . |
| | | N | 28 | 28 |

Based on the Spearman rank correlation (-.119), a very weak negative correlation was exhibited in this data. The p value of .547, being greater than .05, does not provide statistical evidence of a relationship between servant leadership and recordable accidents. The H3 null hypothesis is supported.

*Accident Severity Rate (H4)*

The H4 null hypothesis was: no significant relationship between accident severity rate and servant leadership as measured by the OLA. The Spearman's rank 2-tailed correlation table was produced to investigate the correlation coefficient (Table 4.7).

Table 4.7

*Spearman's Rho 2-Tailed Correlation Coefficient for H4*

| | | | OLA | H4 |
|---|---|---|---|---|
| Spearman's rho | **OLA** | Correlation Coefficient | 1.000 | **.056** |
| | | Sig. (2-tailed) | . | **.777** |
| | | N | 28 | 28 |
| | **H4** | Correlation Coefficient | .056 | 1.000 |
| | | Sig. (2-tailed) | .777 | . |
| | | N | 28 | 28 |

Based on the Spearman rho (.056), it appears that an *extremely* weak positive correlation between the OLA and H4 data points exists. The large p value of .777 indicates no strong evidence of a relationship between servant leadership and accident severity. Based on the results of this sample population, the H4 null hypothesis is supported.

*Defective Parts Produced Rate (H5)*

The H5 null hypothesis was: no significant relationship between defective parts produced rate and servant leadership as measured by the OLA. The Spearman's rank 2-tailed correlation table is offered to examine the correlation coefficient (Table 4.8).

Table 4.8

*Spearman's Rho 2-Tailed Correlation Coefficient for H5*

| | | | OLA | H5 |
|---|---|---|---|---|
| Spearman's Rho | **OLA** | Correlation Coefficient | 1.000 | **-.165** |
| | | Sig. (2-tailed) | . | **.403** |
| | | N | 28 | 28 |
| | **H5** | Correlation Coefficient | -.165 | 1.000 |
| | | Sig. (2-tailed) | .403 | . |
| | | N | 28 | 28 |

Based on the Spearman rank measurement (-.165), very weak negative correlation between the OLA and H5 defective parts rate was determined. The .403 p value coupled with the Spearman rank correlation support the H5 null hypothesis rather than the alternative.

In summary, it is concluded that H1 and H2 demonstrate a moderately strong negative correlative value with regard to the OLA. However, the research data does not support the existence of a relationship between OLA and either H3, H4, or H5.

Modeling Absenteeism and Attrition as Functions of Servant Leadership

Having established a statistically significant relationship between both absenteeism (H1) and attrition (H2) and servant leadership (OLA), it is reasonable to model each of these performance measures as functions of servant leadership. The development of equations to represent how H1 and H2 decrease with increasing levels of servant leadership is needed to increase the understanding of the established correlation. A linear equation provides the

simplest model but does not necessarily match the data's curvature seen in the scatterplots. Thus exponential models were also explored, representing a quantity starting at a fixed amount then decreasing by a certain percentage with each unit increase of servant leadership (OLA).

Based on the Spearman rank measure that revealed significant correlation between OLA and H1, a linear regression line and an exponential curve were created in Figure 4.17 and the corresponding numerical output provided in Table 4.9.

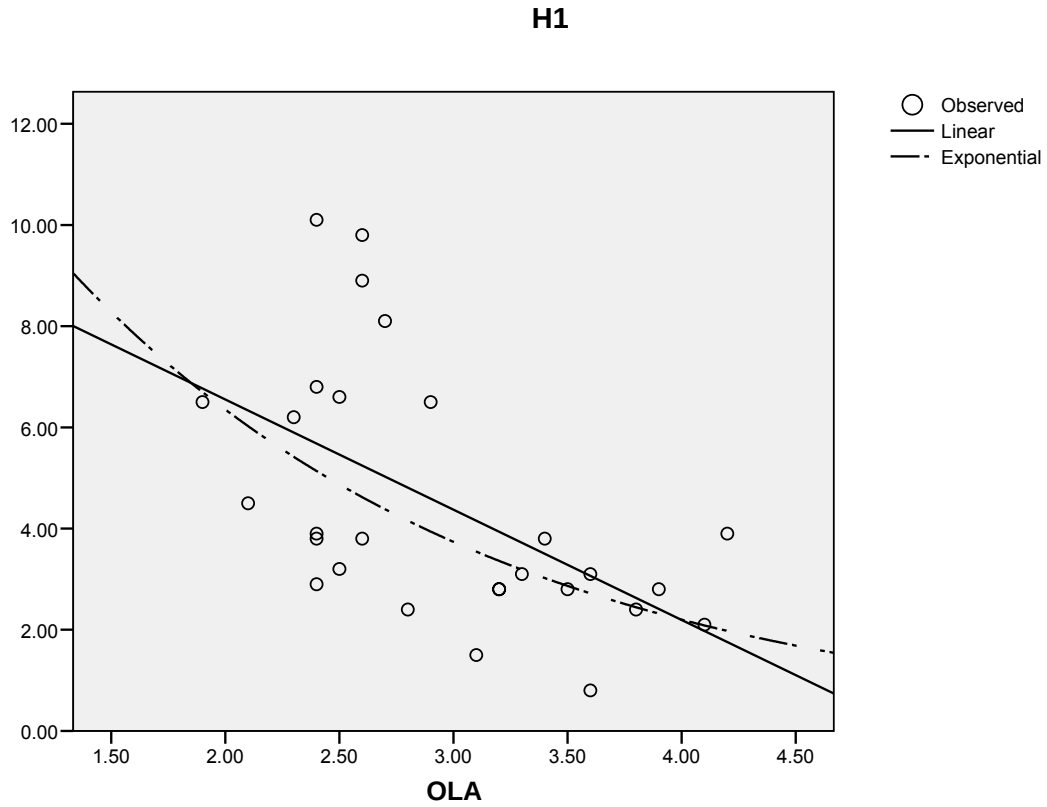



*Figure 4.17.* Exponential and Linear Regression Curve for H1.

Table 4.9

*Linear and Exponential Curve for H1 versus OLA*

Dependent Variable: H1
Independent Variable: OLA

| Equation | Model Summary | | | | | Parameter Estimates | |
|---|---|---|---|---|---|---|---|
| | R Square | F | df1 | df2 | Sig. | Constant | b1 |
| Linear | .297 | 11.003 | 1 | 26 | .003 | **10.907** | **-2.178** |
| Exponential | .327 | 12.606 | 1 | 26 | .001 | **18.345** | **-.530** |

The parameter estimates contained in the regression output provide the following models for H1 versus OLA:

- Best linear model: H1 = 10.91 – 2.18 OLA
- Best Exponential model: $H1 = 18.35e^{-.53OLA}$
    - *e* is the base of the natural logarithm, e≈2.18

The exponential model provides a better visual fit of the data (compared to the linear model) as it captures the upward curve seen in the scatterplot in Figure 4.4. Furthermore the higher $R^2$ value (.327 versus .297) indicates that the exponential model will have smaller errors when using OLA to estimate H1. (An $R^2$ value near 1 indicates that the model captures nearly all the variation in the dependent variable, while $R^2$ near 0 indicates that the model provides little or no useful information in estimating the dependent variable value.) It is useful to observe that the exponential model can be rewritten as $H1=18.35\ (.589)^{OLA}$ (since $e^{-.53} = .589$), implying that the absentee rate is multiplied by .589 (=58.9%) for each increase of one Likert scale unit of OLA. In other words, absenteeism

tends to decrease roughly 41.1% for each increase of one unit in servant leadership.

Based on the significant correlation of H2 (-.547), a linear regression line and an exponential curve were created for H2 and represented by Figure 4.18 and the regression output is displayed in Table 4.10.

Table 4.10.

*Linear and Exponential Curve Data for H2 versus OLA*

Dependent Variable: H2
Independent Variable: OLA

| | Model Summary | | | | | Parameter Estimates | |
|---|---|---|---|---|---|---|---|
| Equation | R Square | F | df1 | df2 | Sig. | Constant | b1 |
| Linear | .326 | 12.578 | 1 | 26 | .002 | 5.675 | -.826 |
| Exponential | .314 | 11.911 | 1 | 26 | .002 | 6.574 | -.253 |

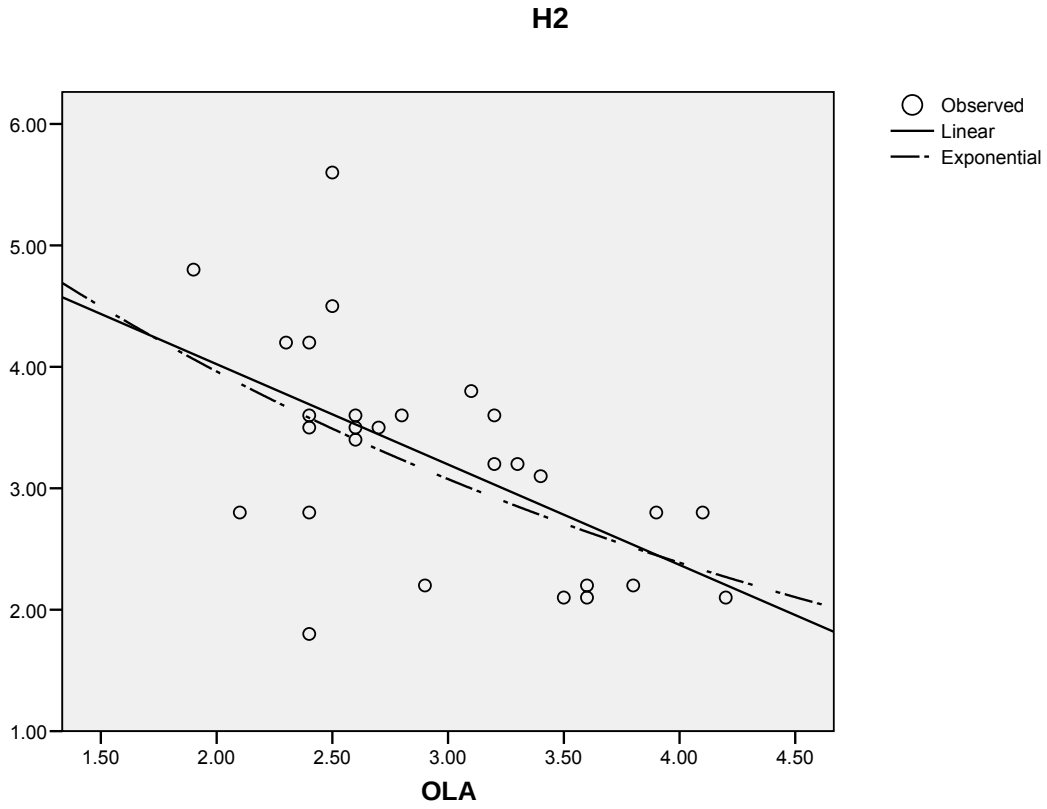



*Figure 4.18.* Exponential and Linear Regression Curve for H2

The parameter estimates contained in the regression output provide the following models for H2 versus OLA:

- Best linear model: H2 = 5.68 – .826 OLA
- Best exponential model: $H2 = 6.58e^{-.253OLA}$
    - *e* is the base of the natural logarithm, e≈2.18

The exponential model provides a similar visual fit of the data (compared to the linear model), and the similar $R^2$ value (.327 versus .297) indicates that the exponential model has comparable errors when using OLA to estimate H2. Thus it is not obvious whether the linear or exponential model is a better fit for representing H2 versus OLA (whereas for H1 versus OLA, the scatterplot showed a clear curvature).

The exponential model can be rewritten as $H2=6.58\ (.776)^{OLA}$ (since $e^{-.253} = .776$), which implies that the attrition rate is multiplied by .776 (= 77.6%) for each increase of one Likert scale unit of OLA . In other words, attrition tends to decrease roughly 22.4% for each increase of one unit in servant leadership.

## Summary

Chapter 4 exploratory data analysis revealed significant correlation between servant leadership and absenteeism (H1) and attrition (H2). The research data did not support the existence of a relationship between servant leadership and the recordable accident rate (H3), accident severity rate (H4), and defective parts produced rate (H5). Further investigation by creating a linear regression line and an exponential curve created both H1 and H2 parameter estimates to represent how H1 and H2 decrease with increasing levels of servant leadership. Chapter 5 will provide a summary review of the findings, conclusions, and implications for future research.

# CHAPTER 5

## SUMMARY AND CONCLUSIONS

This correlative research study considered the association between servant leadership and team effectiveness in the manufacturing sector of business and industry. The quantitative study had a sample size of 3896, representing 28 manufacturing locations within the same organization. The Spearman rank correlation was used to determine the direction and significance of the association between the independent variable of servant leadership and each of five selected dependent variables of manufacturing team effectiveness (H1-absenteeism, H2-attrition, H3-recordable accident rate, H4-accident severity rate, and H5-defective parts produced rate). To achieve the purposes of the research study, one standardized instrument—the OLA—was used to measure servant leadership at each location surveyed. The primary significance of this study lies in that it represents one of the first substantial research efforts related to the outcomes of servant leadership in the business and industry sector. As such, this study provides the opportunity to quantify the outcomes that occur as a result of servant leadership.

Chapter 5 will provide a summary review and offer a discussion of the findings presented in the preceding chapter. Limitations, implications for future research, findings, and conclusions are contained in the chapter discussion.

## Summary Overview of Results

Five hypotheses were tested to determine correlative relationships between the independent variable of servant leadership and team effectiveness dependent variables.

### *Absenteeism (H1)*

The H1 question was related to the assessment of the relationship between reduced employee absenteeism and servant leadership as measured by the OLA. The research confirmed a moderately strong negative association between the OLA and H1 with a Spearman's rank correlation of -.599, thus exhibiting a strong negative correlation. This coupled with a p value of .001 clearly led the researcher to support the H1 alternative hypothesis that reduced absenteeism had a significant relationship with servant leadership in this sample study group.

### *Attrition (H2)*

The connection between servant leadership (OLA) and attrition was the focus of hypothesis 2.The Spearman's rank correlation of -.547 indicated a moderately strong correlation, and the p value of .003 was significant in regard to attrition and servant leadership. The H2 alternative hypothesis of a relationship between servant leadership and attrition is supported within this sample study group.

### *Recordable Accident Rate (H3)*

The stated H3 null hypothesis was: no significant relationship between recordable accident rates and servant leadership as measured by the OLA.

Based on the Spearman rank correlation (-1.19), there is a very weak negative correlation exhibited in this data. The p value of .547 clearly does not provide statistical evidence of a relationship between servant leadership and recordable accidents.

*Accident Severity Rate (H4)*

The examination of the potential relationship between accident severity rate and servant leadership provided the basis for the H4 question. Based on the Spearman rho (.056), a very weak measurable correlation between the OLA and the accident severity rate was revealed. The strong p value of .777 added to the evidence that the H4 null hypothesis was supported in this study.

*Defective Parts Produced Rate (H5)*

The H5 null hypothesis was: no significant relationship between defective parts produced rate and servant leadership as measured by the OLA. Based on the Spearman rank measurement (-.165), it was determined there is only a weak negative correlation between the OLA and H5 defective parts produced rate. The .403 p value coupled with the Spearman rank correlation supported the H4 null hypotheses.

## Conclusion of Findings

In summary, the findings concluded that H1 and H2 demonstrate a moderately strong negative correlative value within this research study. At the same time, it is clear that H3-H5 support their respective null hypotheses.

## Implications for Practice

The findings detailed in Chapter 4 of this study revealed that both absenteeism and attrition tend to decrease as servant leadership increases. The implications related to these findings are extremely significant in the manufacturing environment. As a result of the shortage of skilled labor and continued economic growth, retention of employees is one of the most critical issues facing leaders today. The negative costs related to attrition in the workplace are obvious:

- costs to recruit and train new employees,
- loss of specific knowledge and experience, and
- decreased productivity and work quality.

The research evidence also pointed to the effectiveness of servant leadership in reducing absenteeism in manufacturing. The implications of cost avoidance related to absenteeism and the resulting improvement in teamwork and positive work environment are noteworthy. This finding provides a potentially significant impact on profitability within manufacturing. Absenteeism in business and industry translates to:

- lost productivity,
- increased use of premium wage usage for replacement workers,
- accumulated absenteeism incidents leads to progressive discipline and eventual termination,
- increased training and exposure to part quality defects,
- teamwork disruptions in the assembly environment of manufacturing, and

- administrative costs to secure replacement employees, reassign remaining employees, and recordkeeping.

As business and industry struggle with the shortage of skilled labor, economic growth, and employee turnover, positive employee attendance patterns becomes more critical.

To leverage the potential advantages of servant leadership in reducing absenteeism and attrition in the manufacturing environment, leaders may consider each of Laub's 1999 servant leadership subsets when interacting with employees:

- *Valuing people.* Leaders approach others with an understanding that each person is valuable. Value to others is demonstrated by active listening and careful consideration of what is being shared.
- *Developing people.* Leaders understand the potential of others to grow as servants and leaders. Special attention is given to create a learning environment.
- *Building Community.* By working together and serving others, leaders model collaborative behaviors that build a partnership for team achievement.
- *Displaying Authenticity*. Leaders must understand that they have a number of things to learn from followers. This openness leads to follower trust and increased involvement.

- *Providing Leadership.* Leaders initiate action to serve the needs of the organization and team, not for personal aspiration. Leaders serve and set direction as they communicate with the followers.
- *Sharing Leadership*. Servant leadership recognizes the fact that leaders have positional authority, but an important distinction is that power is shared in decision making and followers are encouraged to act.

To facilitate this consideration of servant leadership, leadership training within the manufacturing segment of business and industry must offer instruction in servant leadership. Greenleaf observed that everyone is born with or is able to develop servant leadership characteristics. As researchers continue to learn about servant leadership and further empirical studies are initiated, more conclusions can be drawn as to its usefulness in leadership development.

## Limitations

This study was limited by the organizational context of the sample groups (a manufacturing setting). The research project examined multiple sites of the same manufacturing corporation, and therefore, generalization to other populations cannot be claimed. Second, some of the team effectiveness constructs in the study are relatively new in terms of empirical research within the manufacturing environment. Third, while the study evaluated over 4000 OLA responses, it still only reflected 28 samples. Each independent facility represented one individual sample.

## Implications for Future Research

Based on the literature review and the findings resulting from this study, several recommendations are offered. The current research focused on team effectiveness measurements that concentrated on human-resource-gathered key performance indicators. While this focus was not listed as a limitation for this study, future research should investigate other effectiveness measurements. The current research focused on team effectiveness measurements that concentrated primarily on human-resource-related key performance indicators. Business and industry offers a number of other team effectiveness measurements in other disciplines within manufacturing (such as finance, logistics, quality, and production).

Second, generalizability of research based on a population drawn from a single organization indicates a need for further studies related to servant leadership and team effectiveness. The same effectiveness measurements could be studied in a wide range of industries and add to the understanding of the possible correlation of servant leadership and team effectiveness.

Third, because this research investigated relationships within the under researched area of servant leadership in the for-profit segment, it will be important for future research to determine if findings from the current study can be replicated within the same industry. The approach employed in this study could be replicated in other manufacturing environments and add important empirical research.

Fourth, the construct of team effectiveness is not defined in the servant leadership literature in relation to the manufacturing environment. Servant leadership is challenged to quantify the benefits of effectiveness in meaningful ways that can translate to productivity measures in business and industry. A need exists to examine the common manufacturing goals utilized in this study and continue to develop psychometrically strong team effectiveness variables for future empirical research in business.

## Summary

In recent years there has been increased interest in the examination of servant leadership. Respected leadership and management expert, Ken Blanchard, when addressing a group of leaders stated, “The world is in desperate need of a different leadership role model . . . . We need servant leaders, instead of self-serving leaders” (Oliver-Mendez, 2006). The overall interpretation of results found that servant leadership had strong correlations with reductions in employee attrition and absenteeism. The implications of cost avoidance related to reduced absenteeism and attrition and the resulting improvement in teamwork and creation of a more positive work environment are noteworthy. The findings related to this study provide preliminary evidence of the potential effectiveness of servant leadership in the for-profit segment of business and therefore, warrant further examination. Organizations that include servant leadership in their leadership practices may translate to organizations that exhibit manufacturing efficiency and energized teams.

Virtually no one ever has the final word by conducting a study that provides a definitive explanation to the research questions of the day. Conflicting opinions among researchers reflect the fact that empirical research is a dynamic progression of discovery. It is a privilege to conduct original empirical research, and hopefully, this embryonic study of business and industry adds a small brick to the wall of knowledge of servant leadership and will inspire additional interest and research in this promising leadership area.

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# APPENDIX A

## ESTIMATED COSTS OF OCCUPATIONAL INJURIES AND ILLNESSES AND ESTIMATED IMPACT ON A COMPANY'S PROFITABILITY

From: http://www.osha.gov/dts/osta/oshasoft/safetwb.html

Estimated Costs of Occupational Injuries and Illnesses and
Estimated Impact on a Company's Profitability

Report for Year: 2007

Employer: xxxxxxxxxxxxxxxx

Prepared by: Ken Rauch on May 14, 2007

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| | |
|---|---|
| The injury or illness selected: | Crushing. |
| Average Direct Cost: | $10,615 |
| Average Indirect Cost: | $11,676 |
| Estimated Total Cost: | $22,291 |
| The net profit margin for this company is | 6.50 % |
| The ADDITIONAL sales necessary | |
| - to cover Indirect Costs are: | $179,631 |
| - to cover Total Costs are: | $342938 |

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| | |
|---|---|
| The injury or illness selected: | Foreign Body. |
| Average Direct Cost: | $317 |
| Average Indirect Cost: | $1,426 |
| Estimated Total Cost: | $1,743 |
| The net profit margin for this company is | 6.50 % |
| The ADDITIONAL sales necessary | |
| - to cover Indirect Costs are: | $21,938 |
| - to cover Total Costs are: | $26,815 |

---

| | |
|---|---|
| The injury or illness selected: | Sprain. |
| Average Direct Cost: | $4,245 |
| Average Indirect Cost: | $6,792 |
| Estimated Total Cost: | $11,037 |
| The net profit margin for this company is | 6.50 % |
| The ADDITIONAL sales necessary | |
| - to cover Indirect Costs are: | $104,492 |
| - to cover Total Costs are: | $169,800 |

---

| | |
|---|---|
| The injury or illness selected: | Contusion. |
| Average Direct Cost: | $2,169 |
| Average Indirect Cost: | $9,760 |

| | |
|---|---|
| Estimated Total Cost: | $11,929 |
| The net profit margin for this company is | 6.50 % |
| The ADDITIONAL sales necessary | |
| - to cover Indirect Costs are: | $150,154 |
| - to cover Total Costs are: | $183523 |

==========

The TOTAL ADDITIONAL SALES required by these 4 incidents is estimated to be between:

$456,215 and $723,076.

The extent to which the employer ultimately pays the direct costs depends on the nature of the employer's workers' compensation insurance policy. The employer always pays the indirect costs.

This report is produced by OSHA's Safety Pays software. Look for OSHA software on the World Wide Web at www.osha.gov.

# APPENDIX B

## COVER LETTER TO HUMAN RESOURCE MANAGERS

NOTE: This is the text of a message emailed to Human Resource Managers at each research location (in conjunction with an inter-company authorization email from the Senior Vice-President of Human Resources (to be read when handing out the survey to employees).

{Date}

{Dear H.R Manager}

President {Name} and {Name, Executive Vice President of HR), approve and support a research project to be conducted among the employees at the _____ plant. You and members of your workgroup are being asked to participate based on specific criteria for this research study. Your participation is encouraged, and is voluntary.

My name is Kenneth E. Rauch, and I am a doctoral candidate at Indiana Wesleyan University majoring in organizational leadership studies. I am conducting a research study for my dissertation examining leadership and work related outcomes. Vocationally I am a Director of Human Resources at G&S Metal Consultants.

The intent of this study is to identify individual and group outcomes as they relate to leadership behaviors. Your organization was selected to participate in this study because of my past professional association with your company.

It should require about 10-20 minutes to complete the Organizational Leadership Assessment (OLA) questions. Your company has been assigned a unique code and your responses are going to be placed in the envelope that is provided by your Human Resource Manager and one of your fellow employees will be asked to mail the pre-paid self addressed envelope back to me.

Your responses will not be identifiable and individual results will not be shared with anyone. Individual scores will result in an overall plant-wide value. Please contact me if you have any questions or concerns about this study. My contact information is listed below. Thank you for your time and consideration.

Regards,

Kenneth E. Rauch
E-Mail: krauch855@yahoo.com
Phone Number: 260-906-6445

# APPENDIX C

## CORPORATE INFORMED CONSENT FORM

I authorize Kenneth E. Rauch, M.S.E., SPHR, a doctoral candidate in organizational leadership at Indiana Wesleyan University, Graduate School of Education, Marion, Indiana, to include my corporation in the research project titled: *Servant Leadership and Team Effectiveness*: *A multi-level correlation study in the industrial manufacturing setting.* I understand each employee's participation in this study is strictly voluntary and individual responses will be destroyed within 90 days of the studies completion.

I further understand that the study will include data collection involving the completion of a 64 question survey and that the results are confidential and the collection method of these results insure participant confidentiality. I further understand that each individual response will be tabulated in a collective sense and results and conclusions will be shared on a plant-wide basis. **Individual responses will not be presented in any form.** Names will remain confidential and only general descriptions and common themes will be reported in the study.

I understand that if I have any questions or concerns regarding the study procedure, I can contact the researcher, Kenneth E. Rauch, at address, 3560 Ashford Blvd, New Haven, IN. 46774, e-mail: krauch855@yahoo.com or Dr. Sharon Drury at Indiana Wesleyan University, 1900 West 50th Street, Marion, IN. 46951-5279, e-mail: sharon.drury@indwes.edu.

In signing this form, I acknowledge that I understand what my corporation's participation in this study involves and I have received a copy of this form. I fully understand that there are minimal risks involved in completing this instrument and results are confidential. I also understand that I may withdraw from this study at any time without penalty and participation is voluntary. I hereby agree to participate, as described above, freely and voluntarily.

_____
Participants Signature / Title

_____
Participants Name Printed

_____
Date

APPENDIX D

STUDY INSTRUMENT: ORGANIZATIONAL LEADERSHIP ASSESSMENT

(OLA)

# Organizational Leadership Assessment

The purpose of this instrument is to allow organizations to discover how their leadership practices and beliefs impact the different ways people function within the organization. This instrument is designed to be taken by people at all levels of the organization including workers, managers and top leadership. As you respond to the different statements, please answer as to what you believe is generally true about your organization or work unit. Please respond with your own personal feelings and beliefs and not those of others, or those that others would want you to have. Respond as to how things are … not as they could be, or should be. Feel free to use the full spectrum of answers (from Strongly Disagree to Strongly Agree). You will find that some of the statements will be easy to respond to while others may require more thought. If you are uncertain, you may want to answer with your first, intuitive response. Please be honest and candid. The response we seek is the one that most closely represents your feelings or beliefs about the statement that is being considered. There are three different sections to this instrument. Carefully read the brief instructions that are given prior to each section. Your involvement in this assessment is anonymous and confidential.

Before completing the assessment it is important to fill in the name of the organization or organizational unit being assessed. If you are assessing an organizational unit (department, team or work unit) rather than the entire organization you will respond to all of the statements in light of that work unit.

1. Strongly Disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly Agree

Section 1
In this section, please respond to each statement as you believe it applies to the entire organization (or organizational unit) including workers, managers/supervisors and top leadership.

Please provide your response to each statement

1. Strongly Disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly Agree

## **In general, people within this organization** ….

1. Trust each other
2. Are clear on the key goals of the organization
3. Are non-judgmental – they keep an open mind
4. Respect each other
5. Know where this organization is headed in the future
6. Maintain high ethical standards
7. Work well together in teams
8. Value differences in culture, race & ethnicity
9. Are caring & compassionate towards each other
10. Demonstrate high integrity & honesty
11. Are trustworthy
12. Relate well to each other
13. Attempt to work with others more than working on their own
14. Are held accountable for reaching work goals
15. Are aware of the needs of others
16. Allow for individuality of style and expression
17. Are encouraged by supervisors to share in making important decisions
18. Work to maintain positive working relationships
19. Accept people as they are
20. View conflict as an opportunity to learn & grow
21. Know how to get along with people

Section 2
In this next section, please respond to each statement as you believe it applies to the leadership of the organization (or organizational unit) including managers/supervisors and top leadership

Please provide your response to each statement
1. Strongly Disagree
2. Disagree

3. Undecided
4. Agree
5. Strongly Agree

## Managers/Supervisors and Top Leadership in this Organization…

22. Communicate a clear vision of the future of the organization
23. Are open to learning from those who are below them in the organization
24. Allow workers to help determine where this organization is headed
25. Work alongside the workers instead of separate from them
26. Use persuasion to influence others instead of coercion or force
27. Don't hesitate to provide the leadership that is needed
28. Promote open communication and sharing of information
29. Give workers the power to make important decisions
30. Provide the support and resources needed to help workers meet their goals
31. Create an environment that encourages learning
32. Are open to receiving criticism & challenge from others
33. Say what they mean, and mean what they say
34. Encourage each person to exercise leadership
35. Admit personal limitations & mistakes
36. Encourage people to take risks even if they may fail
37. Practice the same behavior they expect from others
38. Facilitate the building of community & team
39. Do not demand special recognition for being leaders
40. Lead by example by modeling appropriate behavior
41. Seek to influence others from a positive relationship rather than from the authority of their position
42. Provide opportunities for all workers to develop to their full potential
43. Honestly evaluate themselves before seeking to evaluate others
44. Use their power and authority to benefit the workers
45. Take appropriate action when it is needed
46. Build people up through encouragement and affirmation
47. Encourage workers to work together rather than competing against each other
48. Are humble – they do not promote themselves
49. Communicate clear plans & goals for the organization
50. Provide mentor relationships in order to help people grow professionally
51. Are accountable & responsible to others
52. Are receptive listeners
53. Do not seek after special status or the "perks" of leadership
54. Put the needs of the workers ahead of their own

Section 3

In this next section, please respond to each statement as you believe it is true about you personally and your role in the organization (or organizational unit).

Please provide your response to each statement
1. Strongly Disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly Agree

## In viewing my own role …

55. I feel appreciated by my supervisor for what I contribute
56. I am working at a high level of productivity
57. I am listened to by those above me in the organization
58. I feel good about my contribution to the organization
59. I receive encouragement and affirmation from those above me in the organization
60. My job is important to the success of this organization
61. I trust the leadership of this organization
62. I enjoy working in this organization
63. I am respected by those above me in the organization
64. I am able to be creative in my job
65. In this organization, a person's work is valued more than their title
66. I am able to use my best gifts and abilities in my job

# APPENDIX E

## DATA FROM EACH SAMPLE POPULATION

| | OLA | H1 | H2 | H3 | H4 | H5 |
|---|---|---|---|---|---|---|
| A | 3.4 | 3.8 | 3.1 | 8.2 | 4.8 | 4.6 |
| B | 2.6 | 3.8 | 3.4 | 6.5 | 4.1 | 5.2 |
| C | 4.2 | 3.9 | 2.1 | 5.5 | 3.3 | 3.9 |
| D | 2.5 | 6.6 | 5.6 | 8.9 | 4.6 | 6.7 |
| E | 2.4 | 2.9 | 3.6 | 6.1 | 2.8 | 2.9 |
| F | 2.6 | 9.8 | 3.5 | 4.6 | 1.6 | 5.8 |
| G | 2.4 | 3.8 | 2.8 | 5.5 | 3.9 | 5.1 |
| H | 3.2 | 2.8 | 3.6 | 7.5 | 6.1 | 2.8 |
| I | 3.6 | 3.1 | 2.1 | 3.2 | 1.6 | 3.6 |
| J | 3.9 | 2.8 | 2.8 | 7.5 | 4.1 | 4.2 |
| K | 2.4 | 10.1 | 3.5 | 6.2 | 4.1 | 4.9 |
| L | 2.1 | 4.5 | 2.8 | 4.6 | 1.9 | 3.3 |
| M | 1.9 | 6.5 | 4.8 | 4.8 | 3.1 | 3.8 |
| N | 2.4 | 3.9 | 1.8 | 5.5 | 3.5 | 1.6 |
| O | 3.6 | 0.8 | 2.2 | 6.1 | 4.2 | 2.9 |
| P | 4.1 | 2.1 | 2.8 | 0 | 0 | 4.5 |
| Q | 2.4 | 6.8 | 4.2 | 7.7 | 3.9 | 4.1 |
| R | 2.3 | 6.2 | 4.2 | 6.8 | 3.9 | 3.5 |
| S | 2.8 | 2.4 | 3.6 | 7.9 | 4.1 | 4.8 |
| T | 3.1 | 1.5 | 3.8 | 5 | 2.9 | 4.2 |
| U | 2.5 | 3.2 | 4.5 | 6.1 | 2.6 | 5.1 |
| V | 3.2 | 2.8 | 3.2 | 4.2 | 2.6 | 2.1 |
| W | 2.6 | 8.9 | 3.6 | 5.8 | 4.1 | 6.5 |
| X | 2.7 | 8.1 | 3.5 | 6.7 | 3.9 | 5.5 |
| Y | 3.3 | 3.1 | 3.2 | 3.7 | 1.8 | 2.3 |
| Z | 3.8 | 2.4 | 2.2 | 6.5 | 4.9 | 2.2 |
| AA | 2.9 | 6.5 | 2.2 | 4.5 | 3.8 | 6.8 |
| AB | 3.5 | 2.8 | 2.1 | 5.8 | 3.2 | 2.9 |